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January 29, 2010

Mr. Robert Stallings, President
Envirotech Engineering & Consulting, Inc.
2500 N. 11th Street
Enid, OK 73702

Subject: **AMERICAN REINVESTMENT AND RECOVERY ACT (ARRA) OF 2009
FUNDED
SUBCONTRACT NO. S013213A00
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) CELLS
9 & 10 CONSTRUCTION QUALITY ASSURANCE
NOTICE OF AWARD, LIMITED NOTICE TO PROCEED WITH OFF-SITE
ACTIVITIES**

Dear Mr. Stallings,

It is with pleasure that Washington Closure Hanford LLC (WCH) hereby provides Envirotech Engineering & Consulting, Inc. (Envirotech) **Notice of Award** for Subcontract No. S013213A00 Environmental Restoration Disposal Facility (ERDF) Cells 9 & 10 Construction Quality Assurance.

This Subcontract is comprised of the following documents:

Subcontract Form of Agreement	
Exhibit "A" – General Conditions, Rev. 6	Dated: 07/07/2009
Exhibit "B" – Special Conditions R013213A00, Rev. 1	Dated: 12/14/2009
Attachment 1 For Use When Awarding a Subcontract Under ARRA	
Exhibit "C" – Schedule of Quantities and Prices, Forms A, A-1, A-2, S013213A00, Rev. 2	Dated: 01/25/2010
Exhibit "D" - Scope of Work, 0600X-SW-S0013, Rev. 0	Dated: 01/26/2010
Attachment A Construction Quality Assurance Plan	
Attachment B Supplier QA Program Requirements	
Attachment C Construction Subcontract Submittals	
Exhibit "E" Construction Subcontract-Technical Specifications	
Exhibit "F" Construction Subcontract Drawings	
Exhibit "E" - Technical Specifications, S013213A00, Rev. 0	Dated: 01/25/2010

- | | |
|--|-------------------|
| Exhibit "F" - Subcontractor Prepared Design Drawings, R013213A00, Rev. 0 | Dated: 01/25/2010 |
| Exhibit "G" - Safety and Health Requirements, R013213A00, Rev. 0 | Dated: 11/19/2009 |
| Exhibit "I" - Subcontractor Submittal Requirements Summary, 0600X-SS-S0013, Rev. 0 | Dated: 01/25/2010 |
| Exhibit "J" - Environmental and Waste Management Requirements, R012308A00, Rev. 0 | Dated: 11/09/2009 |
| Exhibit "K" - Subcontractor Operations Support Requirements, R013213A00, Rev. 0 | Dated: 11/19/2009 |

The award to Envirotech is in the amount of \$1,638,000.00, for Pay Items 1.0 through 23 as listed in Exhibit "C", Form A-1, Schedule of Lump Sums and Unit Prices and in accordance with all provisions of the documents included in Request for Proposal No. R013213A00. Labor Hour Unit Prices and test unit prices bid for pay items S.1 through S.13 will be utilized only if additional work is directed by WCH via the change notice process. Subcontract Award shall be effective as of January 29, 2010.

This letter also serves as Envirotech's **Notice to Proceed with Off-Site Activities** including development of subcontractor submittals required for performance of the work, per Exhibit "D" Rev. 0, dated 01/26/2010, Section 2.1.6 and Exhibit "I" Rev. 0, dated 01/25/2010. Within 10 days of the date of this letter, Envirotech's Certificate of Insurance as required by Exhibits "B", and "I" shall be delivered to Dana Looney, the Subcontract Specialist. Delay in delivery of this document is not excusable under the GC-7.24 Excusable Delays clause of Exhibit "A". Site mobilization work is not to commence until a Notice to Proceed with onsite activities has been provided to Envirotech by Mr. Looney.

All commercial communications with WCH regarding this Subcontract shall be addressed to the Subcontract Specialist at the following address:

Washington Closure Hanford LLC
Attention: Dana Looney, H4-17
Subcontract Specialist
2620 Fermi Avenue
Richland, WA 99354
Phone: 509-372-9499
Email: ddlooney@wch-rcc.com

Mr. Charlie Skiba is hereby designated as the Subcontract Technical Representative (STR) for this Subcontract, in accordance with Exhibit "B", Section SC-5.5, *Authority of Personnel*. Technical correspondence regarding Work covered under the Subcontract shall be addressed to the STR as follows: (Please copy all correspondence to the Subcontract Specialist.)

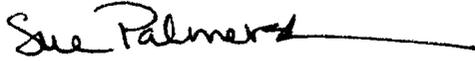
Washington Closure Hanford LLC
Attention: Charlie Skiba, T2-10
Subcontract Technical Representative
2620 Fermi Avenue
Richland, WA 99354
Phone: 509- 373-9476
Email: cvskiba@wch-rcc.com

Envirotech Engineering & Consulting, Inc.
Page 3

Please review all Subcontract documents, sign and return the two original copies of the Subcontract Agreement Form to the undersigned. One fully executed copy will be returned to you.

WCH looks forward to working with Envirotech Engineering & Consulting, Inc. on this Subcontract.

Sincerely,



Sue Palmersheim
Sr. Subcontract Specialist

SP:ddl

Attachments: 1 Subcontract Form of Agreement (2)
2. Conformed Subcontract S013213A00 Documents

Receipt of Notice of Award and Limited Notice to Proceed with Off-Site Activities

Subcontract No. S013213A00

Acknowledged By:

Name

Title

Envirotech Engineering & Consulting, Inc.

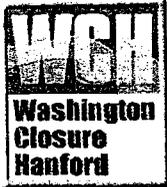
Firm

Date

bcc: D.L. Boecker, T2-03, w/o
W.A. Borlaug, T2-10, w/o
B.C. Covert, T2-03, w/o
R.M. Harrison H0-04, w/o
B.J. Howard, T2-10, w/o
D.D. Looney, H4-17, w/o
W.F. Melvin, T2-10, w/o
S.M. Palmersheim, H4-17, w/o
T.P. Richardson, T2-10, w/o
T.A. Harris, H4-24, w/o
C.V. Skiba, T2-10, w/o
Document Control H4-11, w/o
ERDF Project Files, T2-05, w/o

ORIGINAL

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WASHINGTON CLOSURE HANFORD LLC Construction Subcontract Agreement Form

Subcontractor:	Envirotech Engineering & Consulting, Inc	Subcontract No.:	S013213A00
Address:	2500 N. 11 th Street Enid, OK 73702	Effective Date:	01/29/2010
Contact:	Mr. Robert Stallings / President	Completion Date:	09/30/2011
Telephone:	(580) 234-8780	Work Location:	Hanford Site, Richland, WA
		E-Mail:	stallings@envirotechconsu lting.com
		Code of Account	01.12.YERDFAK114 01.12.YERDFBK114

This Subcontract is effective as of January 29, 2010 between Washington Closure Hanford LLC (Contractor) and the above named SUBCONTRACTOR who hereby agree that all Work specified below, which is a portion of the goods and services provided by CONTRACTOR to the United States Department of Energy (OWNER) under Contract No. DE-AC06-05RL14655 shall be performed by the SUBCONTRACTOR in accordance with all the provisions of this Subcontract, consisting of the documents listed below.

Exhibit "A" - General Conditions, Rev. 6	Dated: 07/07/2009
Exhibit "B" - Special Conditions R013213A00, Rev. 1 Attachment 1 For Use When Awarding a Subcontract Under ARRA	Dated: 12/14/2009
Exhibit "C" - Schedule of Quantities and Prices, Forms A, A-1, A-2, S013213A00, Rev. 2	Dated: 01/25/2010
Exhibit "D" - Scope of Work, 0600X-SW-S0013, Issue for Award, Rev. 0 Attachment A Construction Quality Assurance Plan Attachment B Supplier QA Program Requirements Attachment C Construction Subcontract Submittals Exhibit "E" Construction Subcontract-Technical Specifications Exhibit "F" Construction Subcontract Drawings	Dated: 01/26/2010
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Exhibit "I" - Subcontractor Submittal Requirements Summary, 0600X-SS-S0013, Rev. 0 Issue for Award	Dated: 01/25/2010
Exhibit "J" - Environmental and Waste Management Requirements, R012308A00, Rev. 0	Dated: 11/09/2009
Exhibit "K" - Subcontractor Operations Support Requirements, R013213A00, Rev. 0	Dated: 11/19/2009

- 1. WORK TO BE PERFORMED:** Except as specified elsewhere in the Subcontract, SUBCONTRACTOR shall furnish all plant; labor; materials; tools; supplies; equipment; transportation; supervision; technical, professional and other services; and shall perform all operations

necessary and required to satisfactorily perform: **ERDF Super Cells 9 & 10 Construction Quality Assurance (CQA)**

- 2. **SCHEDULE:** The Work shall be performed in accordance with the dates set forth in Exhibit "B", "COMMENCEMENT, PROGRESS, AND COMPLETION OF THE WORK."
- 3. **COMPENSATION:** As full consideration for the satisfactory performance by SUBCONTRACTOR of this Subcontract, CONTRACTOR shall pay to SUBCONTRACTOR compensation in accordance with the prices set forth in Exhibit "C" and with the payment provisions of Subcontract.
- 4. **ACCEPTED AND AGREED:**

WASHINGTON CLOSURE HANFORD LLC

ENVIROTECH ENGINEERING & CONSULTING, INC.

Name: Sue Palmersheim
Type or Print

Name: Mr. Robert Stallings
Type or Print

Signature: Sue Palmersheim 2/3/10
Date

Signature: Robert Stallings
Date 2/2/2010

Title: Sr. Subcontract Specialist
Type or Print

Title: Owner/President
Type or Print

EXHIBIT A CONSTRUCTION SUBCONTRACTS GENERAL CONDITIONS

DO NOT ALTER THIS DOCUMENT

REV.	DATE	Explanation	Originator	Checker
08	March 23, 2010	Add Deviation to FAR Clause 52.222-8 (NOV 2009)	L. N. Cortez	R. M. Harrison
07	December 31, 2009	Initiate E-Verify Requirements in FAR Clauses	L. N. Cortez	R. M. Harrison
River Corridor Closure Project			Subcontractor Terms & Conditions	

EXHIBIT "A"

WASHINGTON CLOSURE HANFORD, LLC

CONSTRUCTION SUBCONTRACTS

GENERAL CONDITIONS

WASHINGTON CLOSURE HANFORD LLC

EXHIBIT "A"

TABLE OF CONTENTS

1.0	SCOPE	1
2.0	STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES	1
3.0	DEFINITIONS	1
4.0	ENTIRE AGREEMENT	1
5.0	SUBCONTRACT INTERPRETATION	2
6.0	ORDER OF PRECEDENCE	2
7.0	THE SUBCONTRACTOR	2
GC 7.1	Independent Contractor	2
GC 7.2	Permits and Licenses	2
GC 7.3	Labor, Personnel, and Site Work Rules or WCH Policy	3
GC 7.4	Hanford Site Training	3
GC 7.5	Security	3
GC 7.6	Environment, Safety and Health	6
GC 7.7	Site Conditions and Natural Resources	7
GC 7.8	Differing Site Conditions	8
GC 7.9	Environmental Conditions	8
GC 7.10	Cultural Resources Awareness	9
GC 7.11	Worker Safety and Health Program (Civil Penalties Under 10 CFR 851)	9
GC 7.12	Survey Control Points and Layouts	10
GC 7.13	SUBCONTRACTOR'S Work Area	10
GC 7.14	Cleaning Up	10
GC 7.15	Responsibility for Security of Work and Property	10
GC 7.16	SUBCONTRACTOR'S Plant, Equipment, and Facilities	11
GC 7.17	Illumination	12
GC 7.18	Use of CONTRACTOR'S Construction Equipment or Facilities	12
GC 7.19	Warranty	12
GC 7.20	Inspection, Quality Surveillance, Rejection of Materials and Workmanship	13
GC 7.21	Testing	13
GC 7.22	Expediting	13
GC 7.23	Progress	14
GC 7.24	Excusable Delays	14
GC 7.25	Cooperation with Others	14
GC 7.26	Use of Completed Portions of Work	14
GC 7.27	Suspension	15
GC 7.28	Commercial Activities	16
GC 7.29	Publicity and Advertising	16
GC 7.30	Quality Assurance Program	16
GC 7.31	SUBCONTRACTOR Employee Concerns Program	16
GC 7.32	Workers Compensation Requirements	17
GC 7.33	Insurance	17
8.0	THE CONTRACTOR	21
GC 8.1	Authorized Representatives	21
GC 8.2	Medical Examinations	22
GC 8.3	First Aid Facilities	22
GC 8.4	Notices	22
GC 8.5	Changes	22
GC 8.6	Final Inspection and Acceptance	23
GC 8.7	Emergency Situation	24
9.0	GENERAL SUBCONTRACT PROVISIONS	24
GC 9.1	Applicable Law	24
GC 9.2	Words and Phrases	24

GC 9.3	Taxes	25
GC 9.4	Backcharges	25
GC 9.5	Examination of SUBCONTRACTOR's Record's and Accounts.....	26
GC 9.6	Title to Materials Found	26
GC 9.7	Termination for Default	26
GC 9.8	Termination for Convenience.....	27
GC 9.9	Non-Waiver	28
GC 9.10	Indemnity, Fines and Penalties	28
GC 9.11	Patent and Intellectual Property Indemnity.....	29
GC 9.12	Assignments and Subcontracts.....	29
GC 9.13	Survival.....	30
GC 9.14	Disputes.....	30
GC 9.15	Nondisclosure	30
GC 9.16	Procurement Integrity	31
GC 9.17	Rights in Data	31
GC 9.18	Continuity of Service.....	31
GC 9.19	Government Flowdowns.....	31

EXHIBIT "A"
CONSTRUCTION SUBCONTRACT GENERAL CONDITIONS

1.0 SCOPE

This Exhibit A provides General Terms and Conditions that apply to all Subcontracts providing Construction technical services to Washington Closure Hanford LLC.

2.0 STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES

- 2.1 Wherever references are made in this Subcontract to standards or codes in accordance with which the Work under this Subcontract is to be performed, the edition or revision of the standards or codes current on the effective date of this Subcontract shall apply unless otherwise expressly stated. If conflict occurs between any standards and codes referenced in the Subcontract Documents and any Subcontract Documents, the latter shall govern.
- 2.2 If SUBCONTRACTOR discovers any discrepancy or inconsistency between this Subcontract and any law, ordinance, statute, rule, regulation, order or decree, SUBCONTRACTOR shall report the same immediately, in writing, to CONTRACTOR who will issue such further instructions as may be necessary..
- 2.3 In performing Work under this Subcontract, the SUBCONTRACTOR shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), in effect at the time the work under this Subcontract is performed unless relief has been granted in writing by the appropriate regulatory agency.
- 2.4 If during the term of this Subcontract there are changed or new laws, ordinances, statutes, rules, regulations, orders or decrees not known or foreseeable at the time of signing this Subcontract that become effective and that affect the cost or time of performance of this Subcontract, SUBCONTRACTOR shall immediately notify CONTRACTOR in writing and submit detailed documentation of such effect in terms of both time and cost of performing the Subcontract. If the Work is affected by such changed or new laws, ordinances, etc., and CONTRACTOR concurs with the effect of such changes, an equitable adjustment in compensation and time of performance will be made, provided the OWNER approves such equitable adjustments in compensation and time of performance.

3.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH)

"SUBCONTRACTOR" means the legal entity which contracts with WCH.

"Subcontractor's Technical Representative" means the CONTRACTOR'S authorized representative.

"GOVERNMENT/OWNER" means the United States Government and/or the Department of Energy Richland Operations Office (DOE-RL).

4.0 ENTIRE AGREEMENT

This Subcontract embodies the entire agreement between the CONTRACTOR and SUBCONTRACTOR and supersedes all other writings. The parties shall not be bound by, or be liable for any statement, representation, promise, inducement, or understanding not set forth herein.

5.0 SUBCONTRACT INTERPRETATION

All questions concerning interpretation or clarification of this Subcontract, including the discovery of conflicts, errors or omissions, or the acceptable performance thereof by SUBCONTRACTOR, shall be immediately submitted in writing to the CONTRACTOR for resolution. All determinations, instructions, and clarifications of CONTRACTOR shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. At all times SUBCONTRACTOR shall proceed with the Work in accordance with the determinations, instructions, and clarifications of CONTRACTOR. SUBCONTRACTOR shall be solely responsible for requesting instructions or interpretations and shall be solely liable for any costs and expenses arising from its failure to do so.

6.0 ORDER OF PRECEDENCE

The Subcontract Agreement form or the Master Agreement form and individual Task Order Subcontracts, all documents listed therein, and subsequently issued Change Notices and modifications are essential parts of this Subcontract or Master Agreement and Task Order Subcontracts, and a requirement occurring in one is binding as though occurring in all. In resolving conflicts, discrepancies, errors, or omissions pursuant to the General Condition titled "SUBCONTRACT INTERPRETATION," the following order of precedence shall be used:

1. Subcontract Change Notices and Modifications, if any
2. Individual Task Order Subcontracts (which may include supplements to the Master Agreement)
3. The Subcontract Agreement Form or the Master Agreement Form
4. Exhibit "H" – Hanford Site Stabilization Agreement
5. Exhibit "C" – Schedule of Quantities and Prices
6. Exhibit "B" – Special Conditions
7. Exhibit "A" – General Conditions
8. Exhibit "G" – Subcontractor Safety and Health Requirements
9. Exhibit "J" – Subcontractor Environmental and Waste Management Requirements
10. Exhibit "K" – Integrated Work Control Program Procedure PAS-2-1.1 (if applicable)
11. Exhibit "D" – Scope of Work
12. Exhibit "F" – Drawings
13. Exhibit "E" – Technical Specifications
14. Exhibit "I" – Subcontractor Submittal Requirements Summary
15. Subcontractor Submittals

7.0 THE SUBCONTRACTOR

GC 7.1 Independent Contractor

SUBCONTRACTOR represents that it is fully experienced, properly qualified, registered, licensed, equipped, organized, and financed to perform the Work under this Subcontract. Subcontractor shall act as an independent contractor and not as the agent of CONTRACTOR or OWNER in performing this Subcontract, maintaining complete control over its employees and all of its lower-tier suppliers and subcontractors. Nothing contained in this Subcontract, or any lower-tier purchase order or subcontract awarded by SUBCONTRACTOR, shall create any contractual relationship between any lower-tier supplier or subcontractor and either CONTRACTOR or OWNER. SUBCONTRACTOR shall perform the Work hereunder in accordance with its own methods subject to compliance with the Subcontract.

GC 7.2 Permits and Licenses

Except as otherwise specified, SUBCONTRACTOR shall procure and pay for all permits, licenses, and inspections, other than inspections performed by CONTRACTOR and shall furnish any bonds, security, or deposits required by the Government, state, territory, municipality, or other political subdivision to permit performance of the Work hereunder. This includes, but is not necessarily limited to, identifying if such permits and licenses are required, compiling the information and data required for applications to obtain permits and licenses, filing of necessary applications for such permits and licenses, and providing any additional information or data required.

Where permits and licenses are furnished by the CONTRACTOR or OWNER, the SUBCONTRACTOR shall provide all reasonable assistance requested, including any necessary information or data.

GC 7.3 Labor, Personnel, and Site Work Rules or WCH Policy

- 7.3.1 SUBCONTRACTOR shall comply with FAR Clause 52.222.54, "Employment Eligibility Verification." To comply, SUBCONTRACTOR will enroll in E-Verify at www.dhs.gov/E-verify. Upon CONTRACTOR request, SUBCONTRACTOR shall provide CONTRACTOR a copy of its "Maintain Company" page, printed directly from E-Verify.
- 7.3.2 SUBCONTRACTOR shall employ only competent and skilled personnel to perform the Work and shall remove from the Jobsite any SUBCONTRACTOR personnel determined by the CONTRACTOR to be unfit or to be acting in violation of any provision of this Subcontract, WCH, or Hanford Site policies. SUBCONTRACTOR is responsible for maintaining labor relations in such a manner that there is harmony among workers and shall comply with and enforce Jobsite procedures, regulations, and site work rules or WCH policy established by CONTRACTOR and OWNER.
- 7.3.3 SUBCONTRACTOR shall, to the extent permissible under applicable law, comply with the provisions of all labor agreement(s), inclusive of the Hanford Site Stabilization Agreement, which apply to the Work performed under this Subcontract (e.g., Project Agreement, collective bargaining agreement(s), etc.). SUBCONTRACTOR shall pay rates of wages and shall observe hours of Work and other economic terms and conditions of employment equivalent to those paid and observed by CONTRACTOR, all of which shall be subject to CONTRACTOR'S approval.
- 7.3.4 Work assignments and the settlement of jurisdictional disputes shall conform with either the Rules, Regulations, and Procedures of the Plan for Settlement of Jurisdictional Disputes in the Construction Industry, and any successor agreement thereto, or any other mutually established method of determining work assignments and settling jurisdictional disputes.

GC 7.4 Hanford Site Training

In the performance of work under this Subcontract, SUBCONTRACTOR shall adhere to all the training requirements as outlined and stipulated under Exhibit "G", Subcontractor Safety and Health Requirements. SUBCONTRACTOR is responsible for all labor costs for employees receiving training. SUBCONTRACTOR is also responsible for tuition costs for initial and annual refresher Radworker II training. SUBCONTRACTOR is responsible for all scheduling and coordination for Radworker II training. Additionally, SUBCONTRACTOR will be responsible for all costs incurred by CONTRACTOR for failure to report (no shows) to any scheduled training by SUBCONTRACTOR'S personnel and lower-tiers. All scheduling of HGET shall be given to STR at least two weeks in advance of the HGET training needed.

GC 7.5 Security

- 7.5.1 In the performance of the Work under this Subcontract, SUBCONTRACTOR shall comply with the following requirements from the CONTRACTOR/OWNER security program:
- 7.5.1.1 Incidents. Prompt verbal notification of incidents of loss, theft, vandalism, violence, threats, and misconduct to the CONTRACTOR, subsequently detailed in a written report.
- 7.5.1.2 Prohibited Articles. Property passes are required for the movement of prohibited articles into and out of any areas of the Hanford Site. Prohibited articles include:
- Dangerous weapons
 - Explosives, ammunition, and incendiary devices.
 - Controlled substances and drug paraphernalia.
 - Alcoholic beverages.
 - Contraband (includes other items prohibited by law).
- (a) The SUBCONTRACTOR will notify the CONTRACTOR if it becomes necessary to transport prohibited articles onto the Hanford Site. Upon CONTRACTOR and OWNER

approval, the CONTRACTOR will issue the appropriate property pass. SUBCONTRACTOR employees transporting prohibited articles within the Hanford Site must have a valid property pass in their possession.

- (b) SUBCONTRACTOR employees and employees of its lower-tier subcontractors discovered on the Hanford Site in possession of any prohibited article, and not in possession of a valid property pass, shall have their badge and prohibited article returned to the OWNER and their access to the Hanford Site suspended. If it is legally allowable for the individual to possess the prohibited article, the badge and prohibited article will be returned within two working days. If it is illegal for the individual to possess the prohibited article, the prohibited article will be turned over to local law enforcement and the individual's access to the Hanford Site will be denied for a minimum of one (1) year.

7.5.1.3

Security Badges. Any person assigned to work on the Hanford Site or any designated CONTRACTOR facility shall be required to wear a CONTRACTOR issued security badge identifying him/her. If any such persons are foreign nationals, special procedures shall apply when applying for and receiving a security badge. The identification badge shall be worn in plain view, above the waist, on the front of the body, on the outer most layer of clothing. If required, a dosimeter will be issued in conjunction with the security badge.

- (a) Badging for more than seven (7) days requires SUBCONTRACTOR employees, and employees of their lower-tier subcontractors, vendors, and visitors to complete Hanford General Employee Training (HGET).
- (b) SUBCONTRACTOR shall provide to CONTRACTOR the individual(s) complete name (as it appears on the photo identification to be used), name and address of the company being represented, reason for access, social security number, date of birth (mm/dd/yyyy), place of birth (city, state/province, country), and citizenship of the individual(s) requiring a badge at least two (2) working days prior to the date the employee(s) first require the badge(s) for work performance.
- (c) It is the responsibility of the SUBCONTRACTOR to provide the CONTRACTOR with a minimum of two (2) weeks notice if the SUBCONTRACTOR will be requesting access to the work site for a foreign national. This will extend to six (6) weeks notice if the foreign national is from a sensitive country as defined by the OWNER.
- (d) Badges will be issued by CONTRACTOR at locations and according to schedules provided by the CONTRACTOR. Central Badging Office hours are normally 7:00 a.m. through 4:30 p.m., Monday through Thursday, and 7:00 a.m. through 3:30 p.m., Friday. CONTRACTOR temporary badging hours are normally 6:30 a.m. through 5:00 p.m., Monday through Thursday.
- (e) The employee, vendor, or visitor must appear in person to obtain a badge. Badge applicants must provide proof of identification and completion of HGET to the issuing office.
- (f) The OWNER will issue security badges free of charge.
- (g) Security badges will be valid only for the duration of a specific Subcontract or for one (1) calendar year from the date of issuance, whichever ends first. If a Subcontract extends beyond one (1) year, SUBCONTRACTOR employees must obtain a new badge prior to the expiration date of the current badge.
- (h) A new security badge must be obtained whenever there is a significant change in facial appearance, e.g., growth or removal of facial hair, changes resulting from surgery, etc.

(i) U.S. Department of Energy (DOE) security badges are the property of the Government and must be returned to the CONTRACTOR whenever an individual is transferred, terminates employment or otherwise no longer requires the badge. Badges of departing visitors shall be turned over to CONTRACTOR or security force personnel at the conclusion of the visit at the final security checkpoint. It is the responsibility of the SUBCONTRACTOR to implement a Badge Recovery Policy to ensure its employees, vendors and sub-tier personnel:

§ Report a lost or stolen badge to the CONTRACTOR'S representative within twenty-four (24) hours of discovery,

§ Return the security badge to the CONTRACTOR when no longer valid or when requested to by CONTRACTOR, OWNER, and/or protective (security) force personnel.

(j) A charge of \$1,000.00 will be assessed to the SUBCONTRACTOR for each security badge that is not returned. Such charges will be deducted from payments otherwise due the SUBCONTRACTOR. Refund of charges, previously collected for badges and/or dosimeters subsequently found may not be made after the date of final payment to the SUBCONTRACTOR.

(k) The SUBCONTRACTOR is responsible for all labor costs associated with the badging and security training requirements.

7.5.1.4 Security Orientation. Each SUBCONTRACTOR visitor/vendor, and visitor/vendors of their lower-tier subcontractors, will receive a security orientation booklet from the CONTRACTOR or OWNER prior to being issued a visitor security badge.

7.5.1.5 Computer Security. Each SUBCONTRACTOR employee, and employees of their lower-tier subcontractors that are granted access to the CONTRACTOR or OWNER information networks, are required to adhere to the restrictions and limitations of the CONTRACTOR computer security program. These requirements can be obtained from the CONTRACTOR Computer Protection Program Manager.

7.5.1.6 "Official Use Only" Information Security. Each SUBCONTRACTOR employee, and employees of their subcontractors that are granted access to "Official Use Only" sensitive unclassified information provided by the CONTRACTOR/OWNER of the information must adhere to the restrictions and limitations of the CONTRACTOR regarding the access, control, and destruction of the information. These requirements include ensuring that any SUBCONTRACTOR employee or employees of their subcontractors having access to the information meet the following requirements:

(a) The employee granted access to the information has a need to know.

(b) Advise the employee not to divulge the information to persons who do not have a need to know.

(c) Provide protection against theft or unauthorized removal/distribution of the information.

(d) When use of the information is completed, any documents or data shall be destroyed by shredding in accordance with established procedures.

7.5.1.7 A Security Program Plan shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any even prior to commencing Work at the Jobsite. The Program Plan shall include a description of how the SUBCONTRACTOR will implement the applicable requirements of this section and the additional requirements below.

- (a) Controlled access to office, warehouse, material and equipment sites.
- (b) Accountability procedures for the requisition and issue of materials.
- (c) Periodic security checks for all work areas assigned to SUBCONTRACTOR.
- (d) Prompt reporting of incidents of loss, theft, or vandalism to CONTRACTOR, subsequently detailed in writing.
- (e) Coordination and compliance with Site security programs.

7.5.2 The written Security Program Plan is set forth in Exhibit I and is a required Subcontractor Submittal.

7.5.3 Security of Work. SUBCONTRACTOR shall, at all times, conduct all operations under this Subcontract in a manner to avoid the risk of loss, theft, or damage by vandalism, sabotage, or any other means to any work, materials, equipment, or other property at the Jobsite. SUBCONTRACTOR shall continuously inspect all Work, materials and equipment to discover and determine any conditions that might involve such risks and shall be solely responsible for discovery, determination, and correction of any such conditions.

7.5.4 SUBCONTRACTOR shall comply with CONTRACTOR'S security requirements for the Jobsite. SUBCONTRACTOR shall cooperate with CONTRACTOR on all security matters and shall promptly comply with any project security arrangements established by CONTRACTOR or OWNER. Such compliance with these security requirements shall not relieve SUBCONTRACTOR of its responsibility for maintaining proper security for the above-noted items, nor shall it be construed as limiting in any manner SUBCONTRACTOR'S obligation with respect to all applicable laws and regulations and to undertake reasonable action to establish and maintain security conditions at the Jobsite.

7.5.5 The CONTRACTOR may also require that the SUBCONTRACTOR be removed from the job, at no additional cost to CONTRACTOR, employees who endanger persons or property, disruptive to the workforce, or whose continued employment under this Subcontract is inconsistent with the requirements of the Subcontract and/or interests of safety or security at the Hanford Site.

GC 7.6 Environment, Safety and Health

CONTRACTOR sets forth its full requirements for environment, safety and health in Exhibit "G", "Subcontractor Safety and Health Requirements," and Exhibit "J", "Subcontractor Environmental and Waste Management Requirements." These Exhibits, if included in this Subcontract, are fully integrated and a part hereof. The contents of Exhibit "G" and Exhibit "J" notwithstanding, the following applies to this Subcontract:

7.6.1 SUBCONTRACTOR shall be fully and solely responsible for conducting all operations under this Subcontract at all times in such a manner as to avoid the risk of harm to the environment, persons and/property. SUBCONTRACTOR shall continually and diligently inspect all Work, materials, and equipment to discover any conditions that might involve such risks and shall be solely responsible for discovery and correction of any such conditions.

7.6.2 SUBCONTRACTOR shall comply with CONTRACTOR'S Safety and Health Requirements including its Integrated Safety Management System (ISMS) Plan. SUBCONTRACTOR shall have sole responsibility for implementing its safety program. All of SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this General Condition titled "ENVIRONMENT, SAFETY AND HEALTH."

7.6.3 Neither CONTRACTOR nor OWNER shall be responsible for supervising the implementation of SUBCONTRACTOR'S safety program, and neither CONTRACTOR nor OWNER shall have responsibility for the safety of SUBCONTRACTOR'S or its lower-tier suppliers' or subcontractors' employees.

- 7.6.4 SUBCONTRACTOR'S failure to correct an unsafe condition or unsafe act or condition or act that negatively impacts the environment by its personnel after notice thereof shall be grounds for:
- (a) An order to suspend the affected operations until the unsafe condition is corrected and,
 - (b) If the violation continues, default termination of this Subcontract for such failure under the clause entitled, "Termination for Default," below.
- 7.6.5 SUBCONTRACTOR shall designate one or more (as appropriate) Environmental, Safety and Health (ES&H) Representatives(s) acceptable to CONTRACTOR who shall be resident at the Jobsite, have responsibility to correct unsafe conditions or unsafe acts, act on behalf of SUBCONTRACTOR on environment, health and safety matters, and participate in periodic environment, safety and health meetings with CONTRACTOR. SUBCONTRACTOR shall instruct its personnel on the CONTRACTOR'S Health and Safety Requirements and SUBCONTRACTOR'S safety program and shall coordinate with other subcontractors on safety matters.
- 7.6.6 SUBCONTRACTOR shall furnish safety equipment and enforce the use of such equipment by its employees.
- 7.6.7 SUBCONTRACTOR shall maintain accident, injury, and any other records required by applicable laws and regulations (e.g., OSHA, etc.) or by CONTRACTOR and shall furnish CONTRACTOR a monthly summary of injuries and labor hours lost due to injuries.

GC 7.7 Site Conditions and Natural Resources

- 7.7.1 SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the nature and location of the Work and the general and local conditions, including, but not limited to, the following:
- (a) Transportation, access, disposal, and handling and storage of materials.
 - (b) Availability and quality of labor, water, electric power and road conditions.
 - (c) Climatic conditions, tides, and seasons.
 - (d) River hydrology and river stages.
 - (e) Physical conditions at the Jobsite and the project area as a whole.
 - (f) Topography and ground surface conditions.
 - (g) Equipment and facilities needed preliminary to and during the performance of the Work.
 - (h) Radiological conditions of surface or subsurface.
- 7.7.2 The failure of SUBCONTRACTOR to acquaint itself with any applicable conditions will not relieve SUBCONTRACTOR of the responsibility for properly estimating either the difficulties or the cost of successfully performing SUBCONTRACTOR'S obligations under this Subcontract.
- 7.7.3 Where CONTRACTOR or OWNER has made investigations of subsurface conditions in areas where Work is to be performed under this Subcontract, such investigations are made by CONTRACTOR and OWNER for the purpose of study and design. If the records of such investigation are included in the Subcontract Documents, the interpretation of such records shall be the sole responsibility of SUBCONTRACTOR. Neither CONTRACTOR nor OWNER assumes any responsibility whatsoever in respect to the sufficiency or accuracy of such investigations, the records thereof, or of the interpretations set forth; and there is no warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such proportions different from those indicated may not be encountered.

GC 7.8 Differing Site Conditions

- 7.8.1 The Hanford Site was used for nuclear work related to the production of weapons for the defense of the country. Unidentified sources of radioactive material exist in Hanford Site soil. SUBCONTRACTOR shall promptly notify CONTRACTOR, in writing, before proceeding with any Work that SUBCONTRACTOR believes constitutes a differing site condition with respect to:
- (a) Subsurface or latent physical conditions at the Jobsite differing materially from those indicated in this Subcontract, or
 - (b) Previously unknown physical conditions at the Jobsite, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Subcontract, or
- 7.8.2 CONTRACTOR will, as promptly as practicable, investigate such conditions and make a determination. If CONTRACTOR determines that such conditions do materially so differ and cause an increase or decrease in SUBCONTRACTOR'S cost of or the time required for performance of the Work under the Subcontract, an adjustment will be made and the Subcontract modified, in writing, accordingly. No claim of SUBCONTRACTOR under this clause will be allowed unless SUBCONTRACTOR has given the required notice.

GC 7.9 Environmental Conditions

- 7.9.1 Throughout performance of the Work, SUBCONTRACTOR shall conduct all operations in such a way as to minimize impact upon the natural environment and prevent any spread of contaminated or hazardous material. SUBCONTRACTOR shall provide:
- (a) Dust control of its operations within work and all other areas under its control and shall coordinate and cooperate with others for dust control in common areas.
 - (b) Working machinery and equipment with efficient noise suppression devices and all other noise and vibration abatement measures necessary for the protection of workers and the public.
 - (c) Suitable waste, sewage, sanitary, and garbage disposal methods and procedures approved by CONTRACTOR.
 - (d) Provide suitable equipment, facilities, and precautions to prevent the discharge of contaminants into the atmosphere, any body of water, or land areas.
 - (e) All documentation required by all levels of governing authority of this Subcontract concerning environmental requirements.
 - (f) Responsibility for developing and maintaining a written Environmental Compliance Plan in accordance with SUBCONTRACTOR'S established practices, including, but not limited to, compliance with all applicable laws and all applicable requirements in the Project Environmental Control Plan. SUBCONTRACTOR shall have sole responsibility for developing, implementing, and enforcing its Environmental Compliance Plan and SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this clause.
- 7.9.2 SUBCONTRACTOR shall submit its written Environmental Compliance Plan to CONTRACTOR for review before commencing work at the Jobsite. The plan shall be submitted in accordance with Exhibit I and shall include all elements set forth in Exhibit J. CONTRACTOR'S review of SUBCONTRACTOR'S Plan shall not relieve SUBCONTRACTOR of its obligation under this Subcontract or as imposed by law, and SUBCONTRACTOR shall be solely responsible for the adequacy of its Environmental Compliance Plan.
- 7.9.3 If SUBCONTRACTOR encounters material on the Jobsite reasonably believed to be toxic or hazardous material or waste, which has not been addressed in this Subcontract, SUBCONTRACTOR shall

immediately stop work in the affected area and notify CONTRACTOR and OWNER of the condition. Pending receipt of written instructions from CONTRACTOR, SUBCONTRACTOR shall not resume work in the affected area.

GC 7.10 Cultural Resources Awareness

- 7.10.1 SUBCONTRACTOR shall comply with the provisions of the Native American Graves Protection Act 25 USC 3001-3013. This act establishes statute provisions for the treatment of Native American remains and cultural objects. If during the performance of this Subcontract, SUBCONTRACTOR discovers Native American remains and/or cultural objects, SUBCONTRACTOR shall immediately cease work in the affected work area, take reasonable efforts to protect the items discovered, and notify the CONTRACTOR'S STR. Work in the affected area may be prohibited for a period not to exceed thirty (30) calendar days. Cessation of work under the provisions of this article for periods of up to thirty (30) calendar days shall not be cause for an excusable delay.
- 7.10.2 Cultural resources are known to exist on the Hanford Reservation. The SUBCONTRACTOR shall use previously disturbed areas, whenever possible, while conducting work activities. The SUBCONTRACTOR shall also ensure workers are trained to recognize culturally significant resources. CONTRACTOR shall provide one (1) hour training for SUBCONTRACTOR employees on cultural resources awareness. SUBCONTRACTOR is responsible for all labor costs associated with this training. All workers shall be directed to visually inspect for cultural resources during all work activities, particularly in undisturbed areas. If any cultural resources are encountered, work in the vicinity of the discovery shall be suspended immediately. In the event of any such discoveries, the SUBCONTRACTOR shall notify the CONTRACTOR'S onsite representative immediately.

GC 7.11 Worker Safety and Health Program (Civil Penalties Under 10 CFR 851)

- 7.11.1 Section 3173 of Public Law 107-314, Bob Stump National Defense Authorization Act of Fiscal Year 2003 amends the Atomic Energy Act (AEA) by adding Section 234C, Worker Health and Safety Rules for Department of Energy Nuclear Facilities. The Department of Energy (DOE) promulgated Procedural Rules (10 CFR 851); Worker Safety and Health Program to comply with Section 234C. These rules govern the conduct of Contractor, Subcontractor and Supplier activities at DOE sites. Violation of the applicable rules will provide a basis for the assessment of civil penalties under the CFR ruling on Contractors, Subcontractors and Suppliers. Title 10 CFR 851 sets forth the procedures DOE (OWNER) will use in exercising its enforcement authority, including the issuance of "Notices of Violation" and the resolution of an administrative appeal in the event the Contractor or Subcontractor elects to petition the Office of Hearings and Appeals for Review.
- 7.11.2 This Subcontract or Purchase Order is subject to the requirements of 10 CFR 851, if under its terms the Supplier or Subcontractor is required to perform work at the Hanford Site.
- 7.11.3 DOE (OWNER) may assess civil penalties of up to \$70,000 per violation per day. If any violation is a continuing violation, each day of the violation shall constitute a separate violation for the purpose of computing the civil penalty.
- A. A Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists or from one or more practices, means, methods, operations or processes which have been adopted or are in use, in such a place of employment. Severity Level I violation would be subject to the base civil penalty of up to 100% of the maximum base civil penalty of \$70,000.
- B. A Severity Level II violation is an other than serious violation. An other than serious violation occurs where the most serious injury or illness that would potentially result from a hazardous condition cannot be reasonably predicted to cause death or serious physical harm to employees but does have a direct relationship to their safety and health. A Severity Level II violation would be subject to the base civil penalty of up to 50% of the maximum base civil penalty or \$35,000.

7.11.4 Indemnification of Contractor (WCH). To the extent permitted by law, Subcontractor or Supplier assumes full responsibility and shall indemnify, hold harmless and defend WCH and its principal subcontractors, their agents, officers, employees, and directors from any civil liability under Section 234C of the Act or the implementing regulations at 10 CFR 851, arising out of the activities of the SUBCONTRACTOR or Supplier, its lower tier subcontractors, suppliers, agents, employees, officers or directors to the extent that the action or inaction of the Subcontractor or Supplier is found to be a direct or indirect cause of the assessment of fines or penalties or the cause of the institution of proceedings against WCH under Sections 234C of the Act. The Subcontractor's or Supplier's obligation to indemnify and hold harmless shall expressly include attorney's fees and other reasonable costs of defending any action or proceeding instituted under Section 234C of the Act of the implementing regulations at 10 CFR 851. A copy of the implementing regulations at 10 CFR 851 will be made available to the Subcontractor or Supplier upon request.

7.11.5 The contents of this article are to be flowed down to all sub-tier subcontractors and suppliers at any level who will perform work at the Hanford Site.

GC 7.12 Survey Control Points and Layouts

7.12.1 Survey control points, as shown on the drawings, will be established by CONTRACTOR.

7.12.2 SUBCONTRACTOR shall complete the layout of all Work and shall be responsible for all requirements necessary for the Work execution in accordance with the locations, lines, and grades specified or shown on the drawings, subject to such modifications as CONTRACTOR may require as Work progresses.

7.12.3 If SUBCONTRACTOR or any of its lower-tier subcontractors or any of their representatives or employees move or destroy or render inaccurate any survey control point, such control point shall be replaced by CONTRACTOR at SUBCONTRACTOR'S expense. No separate payment will be made for survey Work performed by SUBCONTRACTOR.

GC 7.13 SUBCONTRACTOR'S Work Area

All SUBCONTRACTOR Work areas on the Jobsite will be assigned by CONTRACTOR. SUBCONTRACTOR shall confine its operations to the areas so assigned. Should SUBCONTRACTOR find it necessary or advantageous to use any additional off-site area for any purpose whatsoever, SUBCONTRACTOR shall, at its expense, provide and make its own arrangements for the use of such additional off-site areas.

GC 7.14 Cleaning Up

7.14.1 SUBCONTRACTOR shall, at all times, keep its Work areas in a neat, clean, and safe condition.

7.14.2 Upon completion of any portion of the Work, SUBCONTRACTOR shall promptly remove from the Work area all its equipment, construction plant, temporary structures, and surplus materials not to be used at or near the same location during later stages of the Work.

7.14.3 Upon completion of the Work and before final payment, SUBCONTRACTOR shall, at its expense, satisfactorily dispose of all rubbish, remove all plant, buildings, equipment, and materials belonging to SUBCONTRACTOR and return to CONTRACTOR'S warehouse or Jobsite storage area all salvageable CONTRACTOR- or OWNER-supplied materials. SUBCONTRACTOR shall leave the premises in a neat, clean, and safe condition.

7.14.4 If SUBCONTRACTOR fails to comply with the foregoing, CONTRACTOR will accomplish same at SUBCONTRACTOR'S expense.

GC 7.15 Responsibility for Security of Work and Property

7.15.1 Work in Progress, Materials and Equipment. SUBCONTRACTOR shall be responsible for and shall bear any and all risk of loss of or damage to Work in progress, all materials delivered to the Jobsite,

and all materials and equipment until completion and final acceptance of the Work under this Subcontract.

7.15.2 Delivery, Unloading and Storage. SUBCONTRACTOR'S responsibility for materials and plant equipment required for the performance of this Subcontract shall include:

- (a) Receiving and unloading.
- (b) Storing in a secure place and in a manner subject to CONTRACTOR'S review. Outside storage of materials and equipment subject to degradation by the elements shall be in weather-tight enclosures provided by SUBCONTRACTOR.
- (c) Delivering from storage to construction site all materials and plant equipment as required.
- (d) Maintaining complete and accurate records for CONTRACTOR'S inspection of all materials and plant equipment received, stored, and issued for use in the performance of the Subcontract.

7.15.3 Property. SUBCONTRACTOR shall plan and conduct its operations so as not to:

- (a) Enter upon lands in their natural state unless authorized by CONTRACTOR.
- (b) Damage, close, or obstruct any utility installation, highway, road, or other property until permits have been obtained.
- (c) Disrupt or otherwise interfere with the operation of any pipeline, telephone, electric transmission line, ditch, or structure unless otherwise specifically authorized by this Subcontract.
- (d) Damage or destroy cultivated and planted areas, and vegetation such as trees, plants, shrubs, and grass on or adjacent to the premises which, as determined by CONTRACTOR, do not interfere with the performance of this Subcontract. This includes damage arising from performance of Work by operating equipment or stockpiling materials.

SUBCONTRACTOR shall not be entitled to any extension of time or compensation on account of SUBCONTRACTOR'S failure to protect all materials, equipment, and environment, as described herein. All costs in connection with any repairs or restoration necessary or required by reason of unauthorized obstruction, damage, or use shall be borne by SUBCONTRACTOR.

GC 7.16 SUBCONTRACTOR'S Plant, Equipment, and Facilities

7.16.1 SUBCONTRACTOR shall provide and use for the Work hereunder only such construction plant and equipment as are capable of producing the quality and quantity of Work and materials required by this Subcontract and within the time or times specified in the Subcontract Schedule.

7.16.2 Before proceeding with the Work hereunder, SUBCONTRACTOR shall furnish CONTRACTOR with information and drawings relative to such equipment, plant and facilities as CONTRACTOR may request. Upon written order of CONTRACTOR, SUBCONTRACTOR shall discontinue operation of unsatisfactory plant, equipment, or facilities and shall either modify the unsatisfactory items or remove such items from the Jobsite.

7.16.3 SUBCONTRACTOR shall, at the time any equipment is moved onto the Jobsite, present to CONTRACTOR an itemized list of all equipment and tools, including, but not limited to, power tools, welding machines, pumps, and compressors. Said list must include description and quantity, and serial number where applicable. It is recommended that SUBCONTRACTOR identify its equipment by color (other than yellow), decal, and etching. Before removing any or all equipment, SUBCONTRACTOR shall clear such removal through CONTRACTOR.

7.16.4 SUBCONTRACTOR shall not remove construction plant, equipment, or tools from the Jobsite before the Work is finally accepted, without CONTRACTOR'S written approval. SUBCONTRACTOR shall

obtain CONTRACTOR'S radiological release of all equipment used in radiological areas before removal.

GC 7.17 Illumination

When any Work is performed at night or where daylight is obscured, SUBCONTRACTOR shall, at its expense, provide artificial light sufficient to permit Work to be carried on efficiently, satisfactorily, and safely, and to permit thorough inspection. During such time periods, the access to the place of Work shall also be clearly illuminated. All wiring for electric light and power shall be installed and maintained in a safe manner and meet all applicable codes and standards.

GC 7.18 Use of CONTRACTOR's Construction Equipment or Facilities

Where SUBCONTRACTOR requests CONTRACTOR and CONTRACTOR agrees to make available to SUBCONTRACTOR certain equipment or facilities belonging to CONTRACTOR for the performance of SUBCONTRACTOR Work under the Subcontract, the following shall apply:

- (a) Equipment or facilities will be charged to SUBCONTRACTOR at agreed rental rates.
- (b) CONTRACTOR will furnish a copy of the equipment maintenance and inspection record, and these records shall be maintained by SUBCONTRACTOR during the rental period.
- (c) SUBCONTRACTOR shall assure itself of the condition of such equipment and assume all risks and responsibilities during its use.
- (d) SUBCONTRACTOR shall, as part of its obligation under the General Condition clause titled "INDEMNITY," release, defend, indemnify, and hold harmless CONTRACTOR and OWNER from all claims, demands and liabilities arising from the use of such equipment.
- (e) CONTRACTOR and SUBCONTRACTOR shall jointly inspect such equipment before its use and upon its return. The cost of all necessary repairs or replacement for damage other than normal wear shall be at SUBCONTRACTOR'S expense.
- (f) If such equipment is furnished with an operator, the services of such operator will be performed under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than the payment of wages, Workers' Compensation Insurance, or other benefits.

GC 7.19 Warranty

- 7.19.1 SUBCONTRACTOR warrants to CONTRACTOR and OWNER that equipment and materials furnished under this Subcontract shall be new, of clear title, and of the most suitable grade of their respective kinds for their intended uses, unless otherwise specified. All workmanship shall be first class and performed in accordance with sound construction practices acceptable to CONTRACTOR. All equipment, materials, and workmanship shall also conform to the requirements of this Subcontract.
- 7.19.2 SUBCONTRACTOR warrants all equipment and material it furnishes and all work it performs against defects in design, equipment, materials, or workmanship either for a period from Work commencement to a date twelve (12) months after Final Acceptance of the Project as a whole by OWNER or the standard commercial warranty period, whichever is more advantageous to the CONTRACTOR.
- 7.19.3 If at any time during the warranty period, CONTRACTOR, OWNER, or SUBCONTRACTOR discover any defect in the design, equipment, materials, or workmanship, immediate notice shall be given to the other parties, SUBCONTRACTOR shall, within a reasonable time, propose corrective actions to cure such defects to meet the requirements of this Subcontract.
- 7.19.4 CONTRACTOR, at its sole discretion, may direct SUBCONTRACTOR in writing and SUBCONTRACTOR agrees to:

- (a) Rework, repair, or remove and replace defective equipment and materials or re-perform defective workmanship to acceptable quality at a time and in a manner acceptable to CONTRACTOR.
- (b) Cooperate with others assigned by CONTRACTOR to correct such defects and pay to CONTRACTOR all actual costs reasonably incurred by CONTRACTOR in performing or in having performed corrective actions.
- (c) Propose and negotiate in good faith an equitable reduction in the Subcontract price in lieu of corrective action.

7.19.5 All costs incidental to corrective actions, including demolition for access, removal, disassembly, transportation, reinstallation, reconstruction, retesting, and reinspection, as may be necessary to correct the defect and to demonstrate that the previously defective work conforms to the requirements of this Subcontract, shall be borne by SUBCONTRACTOR.

7.19.6 SUBCONTRACTOR further warrants any and all corrective actions it performs against defects in design, equipment, materials, and workmanship for an additional period of twelve (12) months following acceptance by CONTRACTOR of the corrected Work or standard commercial warranty on product meeting standard warranty.

GC 7.20 Inspection, Quality Surveillance, Rejection of Materials and Workmanship

7.20.1 All material and equipment furnished and Work performed shall be properly inspected by SUBCONTRACTOR at its expense, and shall at all times be subject to quality surveillance and quality audit by CONTRACTOR, OWNER, or their authorized representatives who shall be afforded full and free access to the shops, factories, or other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for such quality surveillance or audit. SUBCONTRACTOR shall provide safe and adequate facilities, drawings, documents, and samples as requested, and shall provide assistance and cooperation, including stoppage of Work to perform such examination (as may be necessary) to determine compliance with the requirements of this Subcontract. Any Work covered before any scheduled quality surveillance or test by CONTRACTOR or OWNER shall be uncovered and replaced at the expense of SUBCONTRACTOR. Failure of CONTRACTOR or OWNER to make such quality surveillance or to discover defective design, materials, or workmanship shall not relieve SUBCONTRACTOR of its obligations under this Subcontract nor prejudice the rights of CONTRACTOR or OWNER thereafter to reject or require the correction of defective Work in accordance with the provisions of this Subcontract.

7.20.2 If any Work is determined by CONTRACTOR or OWNER to be defective or not in conformance with this Subcontract, the provisions of the General Condition clause titled "WARRANTY" shall apply.

GC 7.21 Testing

7.21.1 Unless otherwise provided in the Subcontract, testing of materials or Work shall be performed by SUBCONTRACTOR at its expense and in accordance with Subcontract requirements. Should tests (in addition to those required by this Subcontract) be desired by CONTRACTOR, SUBCONTRACTOR will be advised in ample time to permit such testing. Such additional tests will be at CONTRACTOR'S expense.

7.21.2 SUBCONTRACTOR shall furnish samples, as requested, and shall provide reasonable assistance and cooperation necessary to permit tests to be performed on materials or Work in place, including reasonable stoppage of Work during testing.

GC 7.22 Expediting

The material and equipment furnished and Work performed under this Subcontract shall be subject to expediting by CONTRACTOR or its representatives who shall be allowed full and free access to the shops, factories, and other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for expediting purposes.

As required by CONTRACTOR, SUBCONTRACTOR shall provide detailed schedules and progress reports for use in expediting and shall cooperate with CONTRACTOR in expediting activities.

GC 7.23 Progress

- 7.23.1 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR who shall thereupon take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the currently approved Subcontract Schedule, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of Work per week, and an increase in the amount of construction plant and equipment, all without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of Work and rate of progress required by this Subcontract.
- 7.23.2 Failure of SUBCONTRACTOR to comply with CONTRACTOR'S instructions may be grounds for determination by CONTRACTOR that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate, in accordance with the applicable provisions of this Subcontract, SUBCONTRACTOR'S right to proceed with the performance of the Subcontract.

GC 7.24 Excusable Delays

If SUBCONTRACTOR'S performance of this Subcontract is prevented or delayed by any unforeseeable cause, existing or future, which is beyond the reasonable control of the parties and without the fault or negligence of SUBCONTRACTOR, SUBCONTRACTOR shall, within twenty-four (24) hours of the commencement of any such delay, give to CONTRACTOR written notice thereof and within seven (7) calendar days of commencement of the delay, a written description of the anticipated impact of the delay on performance of the Work. Delays attributable to and within the control of SUBCONTRACTOR'S suppliers or subcontractors of any tier shall be deemed delays within the control of SUBCONTRACTOR. Radiological survey time to release personnel, materials, equipment or facilities from known radiological areas shall not be considered excusable delays. Within seven (7) calendar days after the termination of any excusable delay, SUBCONTRACTOR shall file a written notice with CONTRACTOR specifying the actual duration of the delay. Failure to give any of the above notices shall be sufficient ground for denial of an extension of time. If CONTRACTOR determines that the delay was unforeseeable, beyond the control and without the fault or negligence of SUBCONTRACTOR, CONTRACTOR will determine the duration of the delay and will extend the time of performance of this Subcontract by modifying the Special Condition clause titled "COMMENCEMENT, PROGRESS, AND COMPLETION OF THE WORK," accordingly. Such extension shall be the sole remedy for the delay.

GC 7.25 Cooperation with Others

The CONTRACTOR may undertake or award other Subcontracts for other work or services. CONTRACTOR, OWNER, and other contractors may be working at the Jobsite during the performance of this Subcontract and SUBCONTRACTOR Work or use of certain facilities may be interfered with as a result of such concurrent activities. SUBCONTRACTOR shall fully cooperate with the other subcontractors and with CONTRACTOR employees. CONTRACTOR reserves the right to require SUBCONTRACTOR to schedule the order of performance of the Work to minimize interference with Work of any of the parties involved. The SUBCONTRACTOR shall not commit any act that will interfere with the performance of work by any other subcontractor or by CONTRACTOR employees.

GC 7.26 Use of Completed Portions of Work

- 7.26.1 Whenever, as determined by CONTRACTOR, any portion of the Work performed by SUBCONTRACTOR is suitable for use, CONTRACTOR or OWNER may occupy and use such portion. Use shall not constitute acceptance, relieve SUBCONTRACTOR of its responsibilities, or act as a waiver by CONTRACTOR of any of the terms of the Subcontract.

- 7.26.2 If, as a result of SUBCONTRACTOR'S failure to comply with the provisions of this Subcontract, such use proves to be unsatisfactory to CONTRACTOR or OWNER, CONTRACTOR or OWNER shall have the right to continue such use until such portion of the Work can, without injury to CONTRACTOR or OWNER, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary, for such portion of the Work to comply with the Subcontract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve (12) months unless otherwise mutually agreed in writing between the parties.
- 7.26.3 SUBCONTRACTOR shall not use any permanently installed equipment unless such use is approved in writing by CONTRACTOR. When such use is approved, SUBCONTRACTOR shall at SUBCONTRACTOR'S expense, properly use and maintain and, upon completion of such use, recondition such equipment as required to meet specifications.
- 7.26.4 If CONTRACTOR or OWNER furnishes an operator for such equipment, all services performed shall be under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than payment of such operator's wages, Worker's Compensation Insurance, or other benefits paid directly or indirectly by CONTRACTOR or OWNER.

GC 7.27 Suspension

- 7.27.1 CONTRACTOR may, by written notice to SUBCONTRACTOR, suspend at any time the performance of all or any portion of the Work to be performed under the Subcontract. Upon receipt of such notice, SUBCONTRACTOR shall, unless the notice requires otherwise:
- (a) Immediately discontinue Work on the date and to the extent specified in the notice.
 - (b) Place no further orders or subcontracts for material, services, or facilities with respect to suspended Work other than to the extent required in the notice.
 - (c) Promptly make every reasonable effort to obtain suspension upon terms satisfactory to CONTRACTOR of all orders, subcontracts and rental agreements to the extent they relate to performance of the suspended Work.
 - (d) Continue to protect and maintain the Work, including those portions on which Work has been suspended.
 - (e) Take any other reasonable steps to minimize costs associated with such suspension.
- 7.27.2 As full compensation for such suspension, SUBCONTRACTOR will be reimbursed for the following costs, excluding profit, reasonably incurred, without duplication of any item, to the extent that such costs directly result from such Work suspension:
- (a) A standby charge to be paid to SUBCONTRACTOR during the period of Work suspension, which standby charge shall be sufficient to compensate SUBCONTRACTOR for keeping, to the extent required in the suspension notice, its organization and equipment committed to the Work on a standby basis.
 - (b) All reasonable costs associated with mobilization and demobilization of SUBCONTRACTOR'S plant, forces and equipment.
 - (c) An equitable amount to reimburse SUBCONTRACTOR for the cost of maintaining and protecting that portion of the Work upon which performance has been suspended.
- 7.27.3 Upon receipt of notice to resume suspended Work, SUBCONTRACTOR shall immediately resume performance under this Subcontract to the extent required in the notice.

7.27.4 If the SUBCONTRACTOR intends to assert a claim for equitable adjustment under this clause, it must, within ten (10) calendar days after receipt of notice to resume Work, submit to CONTRACTOR a written statement setting forth the schedule impact and monetary extent of such claim in sufficient detail to permit thorough analysis. No adjustment shall be made for any suspension to the extent that performance would have been suspended, delayed, or interrupted by an SUBCONTRACTOR non-compliance with the requirements of this Subcontract.

GC 7.28 Commercial Activities

Neither SUBCONTRACTOR nor its employees shall establish any commercial activity or issue concessions or permits of any kind to third parties for establishing commercial activities on the Jobsite or any other lands owned or controlled by CONTRACTOR or OWNER.

GC 7.29 Publicity and Advertising

SUBCONTRACTOR shall not make any announcement, take any photographs, or release any information concerning this Subcontract, the Project, or any part thereof to any member of the public, press, business entity, or any official body unless prior written consent is obtained from CONTRACTOR

GC 7.30 Quality Assurance Program

7.30.1 Within thirty (30) calendar days of Subcontract award and in any event prior to commencing Work at any Work Site, SUBCONTRACTOR shall submit a Quality Assurance Program for approval consisting of the following documents:

- (a) Quality Assurance Program Manual.
- (b) Project Quality Assurance Plan.

7.30.2 The Project-specific Quality Assurance Plan (Plan) shall address all activities relevant to the Work and shall demonstrate how all work performed by SUBCONTRACTOR will conform to the Subcontract requirements. The plan shall be submitted in accordance with Exhibit I and shall contain all elements set forth in the Scope of Work.

7.30.3 The Plan shall define the documented quality system to be applied by SUBCONTRACTOR throughout the Work, in accordance with the requirements of Department of Energy (DOE) Order 414.1C.

7.30.4 The Plan shall address the interfaces between CONTRACTOR, SUBCONTRACTOR, and other relevant organizational entities. The plan shall include an organization chart showing SUBCONTRACTOR'S corporate and Project organization responsible for managing, performing and verifying the Work. The organization chart shall be supported with a reporting and functional description of SUBCONTRACTOR'S Project organization and identification of the quality-related responsibilities of key positions.

7.30.5 The Plan shall be updated as necessary throughout the Subcontract, to reflect any changes to SUBCONTRACTOR'S documented quality system. Revisions to the manual and/or Plan must be submitted to the CONTRACTOR for approval prior to implementation.

7.30.6 SUBCONTRACTOR'S documented quality system shall provide for the issuance of a "stop work" order by the SUBCONTRACTOR or CONTRACTOR at any time during the Work when significant adverse quality trends and/or deviations from the approved Quality Assurance Program are found. CONTRACTOR reserves the right to perform Quality Assurance Audits of SUBCONTRACTOR'S approved Quality Assurance Program, including lower-tier suppliers and subcontractors, at any state of the Work.

GC 7.31 SUBCONTRACTOR Employee Concerns Program

7.31.1 The SUBCONTRACTOR'S Employee Concerns Program shall conform to DOE Order 442.1 Employee Concerns Program. The CONTRACTOR reserves the right to audit the SUBCONTRACTOR'S Employee Concerns Program for compliance and implementation at any time. As directed by CONTRACTOR, the SUBCONTRACTOR shall report and correct any deficiencies as deemed necessary.

7.31.2 As a minimum, SUBCONTRACTOR shall establish an Employee Concerns Program (ECP) that ensures employee concerns related to such issues as the environment, safety, health, and management of SUBCONTRACTOR'S programs and facilities are addressed through:

- (a) prompt identification, reporting and resolution of employee concerns regarding site facilities or operations in a manner that provides the highest degree of safe operations;
- (b) free and open expression of employee concerns that results in an independent, objective evaluation;
- (c) supplementation of existing processes with an independent avenue for reporting concerns;
- (d) employees are encouraged to first seek resolution with the first line supervisors or through existing complaint or dispute resolution systems, but that they have the right to report concerns through the DOE ECP; and
- (e) management's intolerance for reprisals against or intimidation of employees who reported concerns.

As an alternative, SUBCONTRACTOR may use CONTRACTOR'S Employee Concern Program. If this is SUBCONTRACTOR'S choice, SUBCONTRACTOR will so indicate here.

7.31.3 In support of the effective implementation of the Employee Concerns Program, SUBCONTRACTOR is required to:

- (a) assist OWNER and CONTRACTOR in the resolution of employee concerns in a manner that protects the health and safety of both employees and the public and ensures effective and efficient operation of CONTRACTOR-related activities under their jurisdiction;
- (b) ensure that SUBCONTRACTOR and lower-tier Subcontractor employees, vendors/visitors are advised that they have the right and responsibility to report concerns relating to the environment, safety, health, or management of CONTRACTOR-related activities; and
- (c) cooperate with assessments used to verify that they have acted to minimize, correct, or prevent recurrence of the situation that precipitated a valid concern.

7.31.4 The SUBCONTRACTOR is responsible for compliance with the requirements made applicable to this Subcontract regardless if the Work is completed by the SUBCONTRACTOR or its subcontractors at any tier. The SUBCONTRACTOR is responsible for flowing down the necessary provisions in this Subcontract to its subcontractors at any tier.

GC 7.32 Workers Compensation Requirements

Subcontractors will be required to provide workers' compensation in accordance with the statutes of the State of Washington (Title 51, Revised Code of Washington) for performance of work under this Subcontract including work performed by lower-tier subcontractors. SUBCONTRACTOR shall be responsible for making all payments and submitting all reports required by Title 51, Section 51.32.073, and Revised Code of Washington.

GC 7.33 Insurance

Unless otherwise specified in this Subcontract, SUBCONTRACTOR shall, at its sole expense, maintain in effect at all times during the performance of the Work insurance coverage with limits not less than those set forth below with

insurers and under forms of policies satisfactory to CONTRACTOR. SUBCONTRACTOR shall deliver to CONTRACTOR no later than ten (10) calendar days after Subcontract award, but in any event before commencing the Work or entering the Jobsite, certificates of insurance as evidence that policies providing such coverage and limits of insurance are in full force and effect. Certificates shall be issued in the form provided by CONTRACTOR or if none is provided in a form acceptable to CONTRACTOR and provide that not less than thirty (30) calendar days advance written notice will be given to CONTRACTOR prior to cancellation or termination of said policies of insurance. SUBCONTRACTOR agrees to notify CONTRACTOR not less than thirty (30) days prior to any material reduction in coverage. Certificates shall identify on their face the PROJECT NAME and the applicable SUBCONTRACT NUMBER.

7.33.1 Standard Coverage:

- A. If there is an exposure or injury to CONTRACTOR'S employees under the U.S. Longshoremen's and Harbor Worker's Compensation Act, the Jones Act or under laws, regulations, or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.
- B. SUBCONTRACTOR must have Employer's Liability of not less than \$1,000,000 each accident.
- C. General Liability Insurance:

1. Coverage

SUBCONTRACTOR shall carry Commercial General Liability Insurance covering all ongoing and completed operations by or on behalf of SUBCONTRACTOR providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and including coverage for:

- a. Premises and Operations;
- b. Products and Completed Operations
- c. Broad form or Blanket Contractual Liability;
- d. Broad form Property Damage (including Completed Operations);
- e. Explosion, Collapse and Underground Hazards; and
- f. Personal Injury Liability.

The Commercial General Liability insurance shall be written on an Occurrence Coverage Form.

2. Policy Limits

For SUBCONTRACTOR'S Commercial General Liability Insurance, the limits of liability for bodily injury, property damage, and personal injury shall be not less than:

- \$2,000,000 Combined single limit for Bodily Injury and Property Damage each occurrence;
- \$2,000,000 Personal Injury Limit each occurrence;
- \$4,000,000 Products-Completed Operations Annual Aggregate Limit; and
- \$4,000,000 General Annual Aggregate Limit (other than Products-Completed Operations).

If the policy does not have an endorsement providing the General Annual Aggregate limits on a per project basis, SUBCONTRACTOR shall provide an endorsement entitled "Amendment of Limits of Insurance (Designated Project or Premises)." Such endorsement shall provide for a Products-Completed Operations Annual Aggregate Limit of not less than \$5,000,000 and a General Annual Aggregate Limit of not less than \$5,000,000. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

3. Additional Insureds.

a. CONTRACTOR and OWNER and their subsidiaries and affiliates, and the officers, directors and employees of the foregoing shall be named as Additional Insureds under the Commercial General Liability Insurance policy, but only with respect to liability arising out of the operations for CONTRACTOR and OWNER by or for SUBCONTRACTOR. In the United States, Insurance Services Office (ISO) form CG 20 10 and CG 20 37 shall be attached to the policy. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insureds, be primary as regards any other coverage maintained for or by the Additional Insureds, and shall contain a cross-liability or severability of interest clause.

b. In lieu of naming CONTRACTOR and OWNER as Additional Insureds under the Commercial General Liability policy, SUBCONTRACTOR may, at CONTRACTOR'S sole discretion and not as an option, provide Owners and Contractors Protective Liability Insurance. If SUBCONTRACTOR purchases Owners and Contractors Protective Liability Insurance for the benefit of OWNER and CONTRACTOR, the policy shall have a combined single limit for Bodily Injury or Property Damage of not less than:

\$2,000,000 Each Occurrence, and
\$2,000,000 Annual Aggregate.

c. The Subcontract (the Work) shall be designated in the Policy Declarations and the policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Named Insured.

D. 1. Automobile Liability Insurance, including coverage for the operation of any vehicle, shall include, but be not limited to, owned, hired and non-owned vehicles: The combined single limit for Bodily Injury and Property Damage Liability shall be not less than \$2,000,000 for any one accident or loss. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

2. SUBCONTRACTOR'S Automobile Liability Insurance shall include coverage for Automobile Contract Liability.

3. The policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Additional Insured. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insured, be primary as regards any other coverage maintained for or by the "Additional Insured's, and shall contain a cross-liability or severability of interest clause.

E. In the event SUBCONTRACTOR maintains insurance covering loss or damage to equipment, tools, or any other property of SUBCONTRACTOR, such insurance shall include an Insurer's waiver of subrogation in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates.

7.33.2 Special Operations Coverage. Should any of the Work:

A. 1. Involve marine operations, SUBCONTRACTOR shall provide or have provided coverage for liabilities arising out of such marine operations, including contractual liability under its commercial General Liability Insurance or Marine Hull and Machinery Insurance, and Protection, and indemnity insurance, each with a minimum Limit of Liability of \$5,000,000. In the event such marine operations involve any SUBCONTRACTOR owned, hired, chartered, or operated vessels, barges, tugs or other marine equipment, SUBCONTRACTOR agrees to provide or have provided Marine Hull and Machinery Insurance and Protection and indemnity insurance and/or Charterer's Liability Insurance.

The combined limit of the Protection and Indemnity Insurance and/or Charterer's Liability Insurance shall be no less than the market value of the vessel or \$5,000,000, whichever is greater. The Protection and Indemnity and/or Charterer's liability and Hull and Machinery coverage shall include coverage for contractual liability, wreck removal, tower's liability, if applicable, and full collision coverage, and shall be endorsed:

- a. To provide full coverage to CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured without limiting coverage to liability "as owner of the vessel" and to delete any "as owner" clause or other language that would limit coverage to liability of an insured "as owner of the vessel;" and
- b. To waive limit to full coverage for the Additional Insured provided by any applicable liability statute.

All marine insurances provided by SUBCONTRACTOR shall include an Insurer's waiver of subrogation in favor of the Additional Insured.

2. Involve the hauling of property in excess of \$300,000, SUBCONTRACTOR shall also carry "All Risk" Transit Insurance, or "All Risk" Motor Truck Cargo Insurance, or such similar form of insurance that will insure against physical loss or damage to the property being transported, moved or handled by SUBCONTRACTOR pursuant to the terms of this Subcontract.

Such insurance shall provide a limit of not less than the replacement cost of the highest value being moved, shall insure the interest of SUBCONTRACTOR, CONTRACTOR, OWNER, and the subsidiaries and affiliates of CONTRACTOR and OWNER as their respective interests may appear and shall include an insurer's waiver of subrogation rights in favor of each.

- B. Involve aircraft (fixed or rotary wing) owned, operated, or chartered by the SUBCONTRACTOR, liability arising from such aircraft shall be insured for a combined single limit not less than \$10,000,000 each occurrence, and such limit shall apply to Bodily Injury (including passengers) and Property Damage Liability. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insureds, include an Insurer's waiver of subrogation in favor of the Additional Insureds, state that it is primary insurance as regards the Additional Insureds, and contain a cross-liability or severability of interest clause. If the aircraft hull is insured, such insurance shall provide for an Insurer's waiver of subrogation rights in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates. In the event SUBCONTRACTOR charters aircraft, the foregoing insurance and evidence of insurance may be furnished by the owner of the chartered aircraft, provided the above requirements are met.
- C. Involve investigation, removal, or remedial action concerning the actual or threatened escape of hazardous substances, SUBCONTRACTOR shall also carry Pollution Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. Such insurance shall provide coverage for both sudden and gradual occurrences arising from the Work performed under this Subcontract. If Completed Operations is limited in the policy, such Completed Operation Coverage shall be for a period of not less than five (5) years. Such insurance shall include a three (3)-year extended discovery period and shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.
- D. Involve inspection, handling, or removal of asbestos, SUBCONTRACTOR shall also carry Asbestos Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. The policy shall be written on an "Occurrence Basis" with no sunset clause. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.

- E. Involve transporting hazardous substances, SUBCONTRACTOR shall also carry Business Automobile Insurance covering liability arising from transportation of hazardous materials in an amount not less than \$2,000,000 per occurrence. Such policy shall include Motor Carrier Endorsement MCS-90. NEITHER CONTRACTOR NOR OWNER IS TO BE NAMED AN ADDITIONAL INSURED FOR THIS POLICY.
- F. Involve treatment, storage, or disposal of hazardous wastes, SUBCONTRACTOR shall furnish an insurance certificate from the designated disposal facility establishing that the facility operator maintains current Environmental Liability Insurance in the amount of not less than \$5,000,000 per occurrence/annual aggregate.

7.33.3 Related Obligations

- A. The requirements contained herein as to types and limits, as well as CONTRACTOR'S approval of insurance coverage to be maintained by SUBCONTRACTOR, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by SUBCONTRACTOR under this Subcontract.
- B. The Certificates of Insurance must provide clear evidence that SUBCONTRACTOR'S Insurance Policies contain the minimum limits of coverage and the special provisions prescribed in this clause.

7.33.4 CONTRACTOR or OWNER-Furnished Insurance:

Neither CONTRACTOR nor OWNER is maintaining any insurance on behalf of SUBCONTRACTOR covering against loss or damage to the Work or to any other property of SUBCONTRACTOR unless otherwise specifically stated herein and as may be described by appendix hereto.

7.33.5 Notifications:

In accordance with the submittal requirements outlined above, SUBCONTRACTOR shall deliver the original and two (2) copies of the Certificate of Insurance required by this clause and all subsequent notices of cancellation, termination, and alteration of such policies to:

Washington Closure Hanford LLC (WCH)
2620 Fermi Avenue
Richland, WA 99354
Attention: Dana Looney Mail Stop: H4-17
Subcontract No: S013213A00

8.0 THE CONTRACTOR

GC 8.1 Authorized Representatives

Before starting Work, SUBCONTRACTOR shall designate in writing an authorized representative acceptable to CONTRACTOR to represent and act for SUBCONTRACTOR and shall specify any and all limitations of such representative's authority. Such representative shall be present or be represented at the Jobsite at all times when Work is in progress, and shall be empowered to receive communications in accordance with this Subcontract on behalf of SUBCONTRACTOR. During periods when the Work is suspended, arrangements shall be made for an authorized representative acceptable to CONTRACTOR for any emergency Work that may be required. All communications given to the authorized representative by CONTRACTOR in accordance with this Subcontract shall be binding upon SUBCONTRACTOR. CONTRACTOR shall designate, in writing, one or more representatives to represent and act for CONTRACTOR and to receive communications from SUBCONTRACTOR. Notification of changes of authorized representatives for either CONTRACTOR or SUBCONTRACTOR shall be provided in advance, in writing, to the other party.

GC 8.2 Medical Examinations

- 8.2.1 CONTRACTOR shall provide all occupational medical requirements including physical examinations through the Hanford Site Occupational Medicine Provider. Subcontractors shall contact the Subcontract Technical Representative to coordinate access to site medical services. All time spent by SUBCONTRACTOR'S employees and transportation costs for medical examinations shall be at the expense of the SUBCONTRACTOR.
- 8.2.2 The SUBCONTRACTOR shall endeavor to employ only those persons who are physically qualified to perform work to which they are assigned at the jobsite with or without reasonable accommodation. If the SUBCONTRACTOR or CONTRACTOR determines that there may be a question of the person's physical fitness to safely perform work to be assigned, the SUBCONTRACTOR shall, with the approval of CONTRACTOR, require such employee to undergo a medical examination.
- 8.2.3 In any case where it is determined that a SUBCONTRACTOR employee is physically unable to perform the essential duties of the job, with or without reasonable accommodation, CONTRACTOR reserves the right to determine whether or not the employee may be assigned to work at the Jobsite and to determine any work assignment limitations to be imposed, and the SUBCONTRACTOR shall be responsible for enforcing CONTRACTOR'S decision.
- 8.2.4 The Hanford Site medical services provider at the discretion of the CONTRACTOR may review medical records.

GC 8.3 First Aid Facilities

Where CONTRACTOR or OWNER have first aid facilities at the Jobsite they may, at their option, make available their first aid facilities to treat employees of SUBCONTRACTOR who may be injured or become ill while performing the Work under this subcontract. If first aid facilities and/or services are made available to SUBCONTRACTOR'S employees, then, in consideration for the use of such facilities and the receipt of such services, SUBCONTRACTOR hereby agrees:

- (a) To release, defend, indemnify, and hold harmless CONTRACTOR, OWNER, and their authorized representatives, successors or assigns, and all of their officers and employees from and against any and all claims, demands, liabilities, including attorney's fees, arising from the receipt of such services or the use of such facilities by SUBCONTRACTOR'S employees, except for claims and demands arising out of the sole active negligence of CONTRACTOR, OWNER, or any of their representatives.
- (b) Upon receipt of any notice from CONTRACTOR or OWNER of any such claim, demand, or liability being pursued against CONTRACTOR or OWNER, to not only undertake the defense of such claim, demand or liability, but also upon entry of judgment, to make any and all payments necessary thereunder.
- (c) If any of SUBCONTRACTOR'S employees require off-site medical services, including transportation thereto, SUBCONTRACTOR shall promptly pay for such services directly to the providers thereof.

GC 8.4 Notices

Any notices provided for hereunder shall be in writing and may be served either personally on the authorized representative of the receiving party at the Jobsite or by registered mail to the address of that party, as shown on the face of the Subcontract Agreement Form or as such address may have been changed by written notice.

GC 8.5 Changes

- 8.5.1 CONTRACTOR may, at any time, without notice to the sureties, by written Change Notice, unilaterally make any change in the Work within the general scope of this Subcontract, including, but not limited to, changes:
- (a) In the drawings, designs, or specifications.

- (b) In the method, manner, or sequence of SUBCONTRACTOR Work.
- (c) In OWNER or CONTRACTOR-furnished facilities, equipment, materials, services, or site(s).
- (d) Directing acceleration or deceleration in the performance of the Work.
- (e) Modifying the Subcontract Schedule or the Subcontract Milestones.

8.5.2 All other changes to this Subcontract outside the scope of work shall be by written Modification signed by both parties

8.5.3 If an emergency occurs that endangers life or property, CONTRACTOR may use oral orders to SUBCONTRACTOR for any work required by reason of such emergency. SUBCONTRACTOR shall commence and complete such emergency work, as directed by CONTRACTOR. Such orders will be confirmed by Change Notice..

8.5.4 If at any time SUBCONTRACTOR believes that acts or omissions of CONTRACTOR or OWNER constitute a change to the Work not covered by a Change Notice, SUBCONTRACTOR shall within ten (10) calendar days of discovery of such act or omission submit a written Change Notice Request explaining, in detail, the basis for the request. CONTRACTOR will either issue a Change Notice or deny the request in writing.

8.5.5 If any change under this clause directly or indirectly causes an increase or decrease in cost of, or the time required for, the performance of any part of the Work under this Subcontract, whether or not changed by any order, an equitable adjustment shall be made and the Subcontract modified accordingly. However, SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors for increased costs in connection with any changes or delays in the Work for claims arising in tort (including negligence), or in contract except as specifically provided in this Subcontract.

8.5.6 If the SUBCONTRACTOR intends to assert a claim for an equitable adjustment under this clause, it must, within (10) calendar days after receipt of a Change Notice provide written notification of such intent and within a further twenty (20) calendar days, pursuant to the Special Condition clause titled "PRICING ADJUSTMENTS," submit to CONTRACTOR a written proposal in sufficient detail to permit thorough analysis and negotiation.

8.5.7 To facilitate prompt resolution, Requests for Equitable Adjustments, require a full and complete submittal of factual causes, contractual bases, quantified impacts, documentary evidence, and proposed resolutions from the Subcontractor. Submittals should address the following:

- (a) A description of the work performed, delayed, or impacted.
- (b) Quantified cost and schedule impacts.
- (c) A description of the contractual bases for entitlement.
- (d) A description of the requested relief.

8.5.8 Any delay by SUBCONTRACTOR in giving notice or presenting a proposal for adjustment under this clause shall be grounds for rejection of the claim if and to the extent CONTRACTOR or OWNER are prejudiced by such delay. In no case shall a claim by SUBCONTRACTOR be considered if asserted after final payment under this Subcontract.

8.5.9 Failure by CONTRACTOR and SUBCONTRACTOR to agree on any adjustment shall be a dispute within the meaning of the General Condition clause titled "DISPUTES." However, SUBCONTRACTOR shall proceed diligently with performance of the work, as changed, pending final resolution of any request for relief, dispute, claim appeal, or action arising under the Subcontract and comply with any decision of CONTRACTOR.

GC 8.6 Final Inspection and Acceptance

8.6.1 When SUBCONTRACTOR considers the Work, or any CONTRACTOR-identified independent portion of the Work, under this Subcontract to be complete and ready for acceptance, SUBCONTRACTOR shall notify CONTRACTOR in writing. CONTRACTOR, with SUBCONTRACTOR'S cooperation, will

conduct such reviews, inspections, and tests as may be reasonably required to satisfy CONTRACTOR that the Work, or identified portion of the Work, conforms to all requirements of the Subcontract. If all or any part of the Work covered by SUBCONTRACTOR'S notice does not conform to Subcontract requirements, CONTRACTOR shall notify SUBCONTRACTOR of such nonconformance and SUBCONTRACTOR shall take corrective action and then have the nonconforming work re-inspected until all Subcontract requirements are satisfied.

8.6.2 CONTRACTOR shall issue a Notice of Provisional Acceptance for individual portions that have been satisfactorily inspected, subject only to CONTRACTOR'S Final Acceptance of the Work as a whole.

8.6.3 CONTRACTOR'S written Notice of Final Acceptance of the Work under this Subcontract shall be final and conclusive, except with regard to latent defects, fraud, or such gross mistakes as amount to fraud, or with regard to CONTRACTOR'S and OWNER'S rights under the General Condition clause titled "WARRANTY."

GC 8.7 Emergency Situation

The OWNER or designee shall have sole discretion to determine when an emergency situation exists at the Hanford Site, except for the DOE Office of River Protection Project facilities, affecting site personnel, the public health, safety, the environment, or security. The Manager, Office of River Protection (ORP), or designee has the discretion to determine whether an emergency situation exists under other ORP contract areas of work that might affect RL workers. In the event that either the RL or ORP Manager or designee determines such an emergency exists, the RL Manager or designee will have the authority to direct any and all activities of the Subcontractor and lower tier subcontractors necessary to resolve the emergency situation. The RL Manager or designee may direct the activities of the Subcontractor and lower subcontractors throughout the duration of the emergency. The Subcontractor shall include this clause in all lower-tier subcontracts for work performed at the Hanford Site.

9.0 GENERAL SUBCONTRACT PROVISIONS

GC 9.1 Applicable Law

Irrespective of the place of performance, the provisions in this Order that adopt or adapt Federal Government Acquisition Regulations (FAR) shall be construed and interpreted according to the federal common law of government contracts as enunciated and applied by federal judicial bodies, boards of contracts appeals, and quasi-judicial agencies of the federal government. To the extent that the federal common law of government contracts is not dispositive, the laws of the State of Washington shall apply.

GC 9.2 Words and Phrases

9.2.1 Where the words "as shown," or words of like import are used in this Subcontract, reference is to the drawings listed in this Subcontract unless the context clearly indicates a different meaning. Where the words "required," "approved," "satisfactory," "determined," "acceptable" or words of like import are used in this Subcontract, action by CONTRACTOR is indicated unless the context clearly indicates otherwise, and all the Work shall be in accordance therewith.

9.2.2 A requirement that a SUBCONTRACTOR-furnished document is to be submitted for or subject to "Authorization to Proceed," "Approval," "Acceptance," "Review," "Comment," or any combinations of such words or words of like import shall mean unless the context clearly indicates otherwise, that SUBCONTRACTOR shall, before implementing the information in the document, submit the document, obtain resolution of any comments and authorization to proceed. Such review shall not mean that a complete check will be performed. Authorization to proceed shall not constitute acceptance or approval of design details, calculations, analyses, tests, construction methods, or materials developed or selected by SUBCONTRACTOR and shall not relieve SUBCONTRACTOR from full compliance with requirements of the Subcontract.

9.2.3 Such action, or failure to act, shall not relieve SUBCONTRACTOR of its contractual responsibilities for performance of this Subcontract. Wherever in this Subcontract it is provided that SUBCONTRACTOR

shall perform certain Work "at its expense" or "without charge" or that certain Work "will not be paid for separately," such quoted words mean that SUBCONTRACTOR shall not be entitled to any additional compensation from CONTRACTOR for such Work, and the cost thereof shall, unless otherwise specified, be considered as included in the payment for other items of the Work.

GC 9.3 Taxes

- 9.3.1 SUBCONTRACTOR shall pay all taxes, levies, duties, and assessments of every nature in connection with the Work under this Subcontract and shall make any and all payroll deductions required by law, and hereby indemnifies and holds harmless CONTRACTOR and OWNER from any liability on account of any and all such taxes, levies, duties, assessments, and deductions.
- 9.3.2 CONTRACTOR recognizes that the tax classification established by Revised Code of Washington (RCW) 82.04.263 (currently taxed at the rate of 0.471 percent) may be applicable to the performance of all work under this Subcontract.
- 9.3.3 Subcontractor will include the above language related to Washington State B&O Tax in all sub-tier subcontracts and purchase orders.

GC 9.4 Backcharges

- 9.4.1 If, under the provisions of this Subcontract, SUBCONTRACTOR is notified by CONTRACTOR to correct defective or nonconforming Work, and SUBCONTRACTOR states or by its actions indicates that it is unable or unwilling to proceed with corrective action in a reasonable time, CONTRACTOR may, upon written notice, proceed to accomplish the redesign, repair, rework, or replacement of nonconforming Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred. Furthermore, if CONTRACTOR agrees to or is required to perform Work for SUBCONTRACTOR, such as cleanup, off-loading, or completion of incomplete Work, CONTRACTOR may, upon written notice, perform such Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred.
- 9.4.2 The cost of backcharge Work shall include:
 - (a) Incurred labor costs, including all payroll additives.
 - (b) Incurred net delivered material costs.
 - (c) Incurred lower-tier supplier and subcontractor costs directly related to performing the corrective action.
 - (d) Equipment and tool rentals at prevailing rates in the Jobsite area.
 - (e) A factor of sixty percent (60%) applied to the total of items (a) through (d) for CONTRACTOR'S overhead, supervision, and administrative costs.
- 9.4.3 The backcharge notice will request SUBCONTRACTOR'S approval for CONTRACTOR to proceed with the required Work. However, failure of SUBCONTRACTOR to grant such approval shall not impair CONTRACTOR'S right to proceed with Work under this or any other provision of this Subcontract.
- 9.4.4 CONTRACTOR shall separately invoice or deduct from payments otherwise due to SUBCONTRACTOR the costs, as provided herein. CONTRACTOR'S right to backcharge is in addition to any and all other rights and remedies provided in this Subcontract or by law. The performance of backcharge Work by CONTRACTOR shall not relieve SUBCONTRACTOR of any of its responsibilities under this Subcontract, including, but not limited to, express or implied warranties, specified standards for quality, contractual liabilities and indemnifications, and the Subcontract Schedule.

GC 9.5 Examination of SUBCONTRACTOR's Record's and Accounts

SUBCONTRACTOR shall maintain a separate and distinct set of accounts and records in accordance with the General Condition entitled "DEAR 970.5232-3, Accounts, Records and Inspections (DEC 2000)." Inspection, copying, auditing and retention of such records shall be in accordance with the above General Condition and the General Condition entitled "DEAR 970.5204-3, Access To and Ownership of Records (DEC 2000)."

GC 9.6 Title to Materials Found

The title to water, soil, rock, gravel, sand, minerals, timber, and any other materials developed or obtained in the excavation or other operations of SUBCONTRACTOR or any of its lower-tier subcontractors and the right to use said materials or dispose of same is hereby expressly reserved by OWNER. Neither SUBCONTRACTOR, its lower-tier subcontractors, nor any of their representatives or employees shall have any right, title, or interest in said materials, nor shall they assert or make any claim thereto. SUBCONTRACTOR may, at the sole discretion of OWNER, be permitted, without charge, to use in the Work any such materials that meet the requirements of this Subcontract.

GC 9.7 Termination for Default

9.7.1 Notwithstanding any other provisions of this Subcontract, SUBCONTRACTOR shall be considered in default of its contractual obligations under this Subcontract if SUBCONTRACTOR:

- (a) Performs work that fails to conform to the requirements of this Subcontract.
- (b) Fails to make progress so as to endanger performance of this Subcontract.
- (c) Abandons or refuses to proceed with any of the Work, including modifications directed pursuant to the General Condition clause titled "CHANGES."
- (d) Fails to fulfill or comply with any of the terms of this Subcontract.
- (e) Engages in behavior that is dishonest, fraudulent, or constitutes a conflict of interest with SUBCONTRACTOR'S obligations under this Subcontract.
- (f) Becomes insolvent or makes a general assignment for the benefit of creditors or reasonable grounds for insecurity arise with respect to SUBCONTRACTOR'S performance.
- (g) Fails to correct an unsafe condition or noncompliance or demonstrates a persistent pattern of poor safety performance.

9.7.2 Upon the occurrence of any of the foregoing, CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the nature of the failure and of CONTRACTOR'S intention to terminate the Subcontract for default. If SUBCONTRACTOR does not cure such failure within seven (7) calendar days from receipt of notification, or sooner if safety to persons is involved, or fails to provide satisfactory evidence that such default will be corrected within a reasonable time, CONTRACTOR may, by written notice to SUBCONTRACTOR and without notice to SUBCONTRACTOR'S sureties, if any, terminate in whole or in part SUBCONTRACTOR'S right to proceed with the Work and CONTRACTOR may prosecute the Work to completion by contract or by any other method deemed expedient. CONTRACTOR may take possession of and utilize any data, designs, licenses, equipment, materials, plant, tools, and property of any kind furnished by SUBCONTRACTOR and necessary to complete the Work.

9.7.3 SUBCONTRACTOR and its sureties, if any, shall be liable for all costs in excess of the Subcontract price for such terminated work reasonably and necessarily incurred in the completion of the Work as scheduled, including cost of administration of any purchase order or subcontract awarded to others for completion.

9.7.4 Upon termination for default, SUBCONTRACTOR shall:

- (a) Immediately discontinue work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts to the extent that they relate to the performance of the terminated work.
- (b) Inventory, maintain, and turn over to the CONTRACTOR all data, designs, licenses, equipment, materials, plant, tools, and property furnished by SUBCONTRACTOR or provided by CONTRACTOR for performance of the terminated work.
- (c) Promptly obtain cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for performance of the terminated work or assign those agreements as directed by CONTRACTOR.
- (d) Cooperate with the CONTRACTOR in transfer of data, designs, licenses, and information and disposition of work in progress so as to mitigate damages.
- (e) Comply with other reasonable requests from CONTRACTOR regarding the terminated work.
- (f) Continue to perform in accordance with all of the terms and conditions of this Subcontract of such portion of the Work that is not terminated.

9.7.5 If, after termination pursuant to this clause, it is determined for any reason that SUBCONTRACTOR was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to the General Condition clause titled "TERMINATION FOR CONVENIENCE."

GC 9.8 Termination for Convenience

9.8.1 CONTRACTOR may, at its option, terminate for convenience any of the Work under this Subcontract in whole or, from time to time, in part, at any time by written notice to SUBCONTRACTOR. Such notice shall specify the extent to which the performance of the Work is terminated and the effective date of such termination. Upon receipt of such notice SUBCONTRACTOR shall:

- (a) Immediately discontinue the Work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts for materials, services, or facilities, other than as may be required for completion of such portion of the Work that is not terminated.
- (b) Promptly obtain assignment or cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for the performance of the terminated work or assign those agreements directed by CONTRACTOR.
- (c) Assist CONTRACTOR in the maintenance, protection, and disposition of work in progress, plant, tools, equipment, property, and materials acquired by SUBCONTRACTOR or furnished by CONTRACTOR under this Subcontract.
- (d) Complete performance of such portion of the Work that is not terminated.

9.8.2 Upon any such termination, SUBCONTRACTOR shall waive any claims for damages, including loss of anticipated profits; on account thereof, but as the sole right and remedy of SUBCONTRACTOR, CONTRACTOR shall pay in accordance with the following:

- (a) The subcontract price corresponding to the work performed in accordance with this Subcontract before such notice of termination.
- (b) All reasonable costs for work thereafter performed, as specified in such notice.
- (c) Reasonable administrative costs of settling and paying claims arising from terminating work under purchase orders or subcontracts.

(d) Reasonable costs incurred in demobilization and the disposition of residual material, plant, and equipment.

(e) A reasonable overhead and profit on items (a) through (d) of this clause.

9.8.3 SUBCONTRACTOR shall submit within thirty (30) calendar days after receipt of notice of termination, a written statement setting forth its proposal for an adjustment to the subcontract price to include only the incurred costs described in this clause. CONTRACTOR shall review, analyze, and verify such proposal, and negotiate an equitable adjustment, and the Subcontract shall be modified accordingly.

GC 9.9 Non-Waiver

Failure by CONTRACTOR to insist upon strict performance of any terms or conditions of this Subcontract, or failure or delay to exercise any rights or remedies provided herein or by law, or failure to properly notify SUBCONTRACTOR in the event of breach, or the acceptance of or payment for any goods or services hereunder, or the review or failure to review designs shall not release SUBCONTRACTOR from any of the warranties or obligations of this Subcontract and shall not be deemed a waiver of any right of CONTRACTOR or OWNER to insist upon strict performance hereof or any of its rights or remedies as to any prior or subsequent default hereunder, nor shall any termination of Work under this Subcontract by CONTRACTOR operate as a waiver of any of the terms hereof.

GC 9.10 Indemnity, Fines and Penalties

9.10.1 SUBCONTRACTOR hereby releases and shall indemnify, defend, and hold harmless CONTRACTOR, OWNER, and their subsidiaries and affiliates and the officers, agents, employees, successors and assigns and authorized representatives of all the foregoing from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs and expenses of whatsoever kind or nature, in connection with or incidental to the performance of this subcontract, whether arising before or after completion of the Work hereunder and in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part, or claimed to be caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of SUBCONTRACTOR, its lower-tier suppliers, subcontractors or of anyone acting under its direction or control or on its behalf in connection with or incidental to the performance of this Subcontract. SUBCONTRACTOR'S aforesaid release, indemnity, and hold harmless obligations, or portions or applications thereof, shall apply to the extent of its negligence or fault and to the fullest extent permitted by law.

9.10.2 The foregoing shall include, but is not limited to, indemnity for:

(a) Property damage and injury to or death of any person, including employees of CONTRACTOR, OWNER or SUBCONTRACTOR.

(b) The breach by SUBCONTRACTOR of any representation, warranty, covenant, or performance obligation of this subcontract.

(c) Events which are directly or indirectly caused by or incident to the radioactive, toxic and/or hazardous properties of any substances.

(d) Events which arise out of any state or federal statute relating to radioactive, toxic and/or hazardous properties, such as the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) or Resource Conservation and Recovery Act of 1976 (RCRA), and shall apply to any clean-up or response costs occasioned by the transport, treatment, storage or disposal by SUBCONTRACTOR or any third party of radioactive, toxic and/or hazardous properties.

9.10.3 SUBCONTRACTOR specifically waives any immunity provided against this indemnity by an industrial insurance or workers' compensation statute.

9.10.4 SUBCONTRACTOR is liable to CONTRACTOR for fines and penalties assessed by any governmental entity against CONTRACTOR or OWNER as a result of SUBCONTRACTOR'S performance or lack of performance. SUBCONTRACTOR shall indemnify and hold harmless CONTRACTOR and OWNER from and against any and all claims, demands, actions, causes of action, suits, damages, expenses, including attorney's fees, and liabilities whatsoever resulting from or arising in any manner on account of the assessment of said fines and penalties against CONTRACTOR or OWNER.

GC 9.11 Patent and Intellectual Property Indemnity

9.11.1 In addition to FAR 52.227-4, Patent Indemnity-Construction Contracts (APR 1984), SUBCONTRACTOR hereby indemnifies and shall defend and hold harmless CONTRACTOR, OWNER, and their representatives from and against any and all claims, actions, losses, damages, and expenses, including attorney's fees, arising from any claim, whether rightful or otherwise, that any concept, product, design, equipment, material, process, copyrighted material or confidential information, or any part thereof, furnished by SUBCONTRACTOR under this Subcontract constitutes an infringement of any patent or copyrighted material or a theft of trade secrets. If use of any part of such concept, product, design, equipment, material, process, copyrighted material or confidential information is limited or prohibited, SUBCONTRACTOR shall, at its sole expense, procure the necessary licenses to use the infringing or a modified by non-infringing concept, product, design, equipment, material, process, copyrighted material or confidential information or, with CONTRACTOR'S OR OWNER'S prior written approval, replace it with substantially equal but non-infringing concepts, products, designs, equipment, materials, processes, copyrighted material or confidential information; provided, however,

(a) That any such substituted or modified concepts, products, designs, equipment, material, processes, copyrighted material, or confidential information shall meet all the requirements and be subject to all the provisions of this Subcontract.

(b) That such replacement or modification shall not modify or relieve SUBCONTRACTOR of its obligations under this Subcontract.

9.11.2 The foregoing obligation shall not apply to any concept, product, design, equipment, material, process, copyrighted material, or confidential information the detailed design of which (excluding rating and/or performance specifications) has been furnished in writing by CONTRACTOR or OWNER to SUBCONTRACTOR.

GC 9.12 Assignments and Subcontracts

9.12.1 Any assignment of this Subcontract or rights hereunder, in whole or part, without the prior written consent of CONTRACTOR shall be void, except that upon ten (10) calendar days written notice to CONTRACTOR, SUBCONTRACTOR may assign monies due or to become due under this Subcontract, provided that any assignment of monies shall be subject to proper set-offs in favor of CONTRACTOR and any deductions provided for in this Subcontract.

9.12.2 SUBCONTRACTOR shall not subcontract with any third party for the performance of all or any portion of the Work without the advance written approval of CONTRACTOR. Lower-tier subcontracts and purchase orders must include provisions to secure all rights and remedies of CONTRACTOR and OWNER provided under this Subcontract, and must impose upon the lower-tier supplier and subcontractor all of the general duties and obligations required to fulfill this Subcontract.

9.12.3 Copies of all purchase and subcontract agreements are to be provided to CONTRACTOR upon request. Pricing may be deleted unless the compensation to be paid thereunder is reimbursable under this Subcontract.

9.12.4 No assignment or subcontract will be approved that would relieve SUBCONTRACTOR or its sureties, if any, of their responsibilities under this Subcontract.

GC 9.13 Survival

The rights and obligations of the parties that by their nature survive termination or completion of this Subcontract, including, but not limited to, those set forth in the General Conditions titled "WARRANTY" and "INDEMNITY," shall remain in full force and effect.

GC 9.14 Disputes

- 9.14.1 SUBCONTRACTOR shall proceed diligently with performance of the Work, pending final resolution of any request for relief, dispute, claim, appeal, or action arising under the Subcontract, and comply with any decision of CONTRACTOR. SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors in tort (including negligence), or contract except as specifically provided in this Subcontract.
- 9.14.2 Any claim for an adjustment to the Subcontract price or time of performance which cannot be resolved by negotiation shall be considered a dispute within the meaning of this clause.
- 9.14.3 If for any reason SUBCONTRACTOR and CONTRACTOR are unable to resolve a claim for an adjustment, SUBCONTRACTOR or CONTRACTOR shall notify the other party in writing that a dispute exists and request or provide a final determination by CONTRACTOR. Any such request by SUBCONTRACTOR shall be clearly identified by reference to this clause and shall summarize the facts in dispute and SUBCONTRACTOR'S proposal for resolution.
- 9.14.4 If CONTRACTOR'S final determination is not accepted by SUBCONTRACTOR the matter shall, within thirty (30) calendar days, be referred to senior executives of the parties who shall have designated authority to settle the dispute. The parties shall promptly prepare and exchange memoranda stating the issues in dispute and their respective positions, summarizing the negotiations that have taken place and attaching relevant documents.
- 9.14.5 The senior executives will meet for negotiations at a mutually agreed time and place. If the matter has not been resolved within thirty (30) calendar days of the commencement of such negotiations, the parties agree to consider resolution of the dispute through some form of Alternative Dispute Resolution (ADR) process that is mutually acceptable to the parties.
- 9.14.6 Should the parties agree to pursue an ADR process, each party will be responsible for its own expenses incurred to resolve the dispute during the ADR process.
- 9.14.7 If the parties do not agree to an ADR process or are unable to resolve the dispute through ADR, either party shall then have the right to pursue any legal remedy.

GC 9.15 Nondisclosure

- 9.15.1 SUBCONTRACTOR agrees not to divulge to third parties, without the written consent of CONTRACTOR or OWNER, any information obtained from or through CONTRACTOR or OWNER in connection with the performance of this Subcontract unless:
 - (a) The information is known to SUBCONTRACTOR before obtaining the same from CONTRACTOR or OWNER;
 - (b) The information is, at the time of disclosure by SUBCONTRACTOR, then in the public domain; or
 - (c) The information is obtained by SUBCONTRACTOR from a third party who did not receive same, directly or indirectly, from CONTRACTOR or OWNER and who has no obligation of secrecy with respect thereto.
- 9.15.2 SUBCONTRACTOR further agrees that it will not, without the prior written consent of CONTRACTOR or OWNER, disclose to any third party any information developed or obtained by SUBCONTRACTOR

in the performance of this Subcontract except to the extent that such information falls within one of the categories described in (a), (b), or (c) above.

- 9.15.3 If so requested by CONTRACTOR or OWNER, SUBCONTRACTOR further agrees to require its employees to execute a nondisclosure agreement before performing any Work under this Subcontract.

GC 9.16 Procurement Integrity

- 9.16.1 The SUBCONTRACTOR warrants that it is familiar with and will comply with all the requirements of Section 27 of the Office of Federal Procurement Policy Act of 1988 (41 U.S.C. §423), as implemented in the Federal Acquisition Regulations (referred to in this clause as "the Act"), including, but not limited to (1) prohibitions on giving or offering future employment, money, or anything of value to a procurement official, (2) prohibitions on soliciting or obtaining from an agency, prior to award, any proprietary or source selection information regarding the procurement, and (3) limits on participation of former government employees and officials in negotiation and performance of government contracts. For a violation of the Act, the Government may reduce the fee or profit on the contract, terminate all or a portion of the contract for default, suspend or debar the contractor from future Federal Government work, impose fines or imprisonment, or pursue other legal remedies.
- 9.16.2 In addition to any other remedies provided by law or herein, the SUBCONTRACTOR agrees to indemnify and hold CONTRACTOR harmless to the full extent of any loss (including any reduction in fee or profit), damages, or expenses (including attorney's fees) if any of the SUBCONTRACTOR'S actions, acting alone or in concert with any other person or entity, cause the government to enforce the provisions of the Act or related regulations against CONTRACTOR.
- 9.16.3 The SUBCONTRACTOR agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all lower-tier subcontracts in amounts exceeding \$100,000.00.

GC 9.17 Rights in Data

When design and/or data is furnished under this Subcontract, FAR 52.227-14 applies.

GC 9.18 Continuity of Service

- 9.18.1 The SUBCONTRACTOR recognizes that the services performed under this Subcontract are vital to the OWNER and must be continued without interruption, and that, upon expiration of the Prime Contract between the OWNER and the CONTRACTOR, a successor, either the Government or another Contractor, may continue to require that the services be performed. The CONTRACTOR shall provide a sixty (60) day written notice to the SUBCONTRACTOR once the successor has been named. The SUBCONTRACTOR shall work with the OWNER and the CONTRACTOR to ensure an efficient transfer to the successor is made.
- 9.18.2 CONTRACTOR may assign this Subcontract to the OWNER or to such party as OWNER may designate to perform CONTRACTOR'S obligations hereunder. Upon receipt by SUBCONTRACTOR of written notice that the OWNER or a party so designated by the OWNER has accepted an assignment of this Subcontract, CONTRACTOR shall be relieved of all responsibility hereunder and SUBCONTRACTOR shall thereafter look solely to such assignee for performance of CONTRACTOR'S obligations.

GC 9.19 Government Flowdowns

The Federal Acquisition Regulation (FAR), the Department of Energy (DOE) FAR Supplement (DEAR) clauses, and the DOE Procurement Regulations incorporated herein shall have the same force and effect as if printed in full text. Upon request, CONTRACTOR will make their full text available. Wherever necessary to make the context of the FAR and DEAR clauses applicable to this Subcontract, the term "Contractor" shall mean "SUBCONTRACTOR," the term "Contract" shall mean this Subcontract, and the term "Government," "Contracting Officer" and equivalent phrases shall mean the CONTRACTOR'S representative, except the terms "Government" and "Contracting Officer"

do not change: (1) in the phrases "Government Property," "Government-Furnished Property," and "Government-Owned Property"; (2) in the patent clauses incorporated herein; (3) when a right, act, authorization or obligation can be granted or performed only by the Government's duly authorized representative; (4) when title to property is to be transferred directly to the Government; (5) when access to proprietary financial information or other proprietary data is required except for authorized audit rights; and (6) where specifically modified herein.

9.19.1 Applicable to All Subcontracts

CLAUSE	TITLE
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)
52.223-3	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997) – ALT 1 (JUL 1995)
522.22	PRIVACY ACT NOTIFICATION (APR 1984)
52.224-2	PRIVACY ACT (APR 1984)
52.225-11	BUY AMERICAN ACT – CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS AND NORTH AMERICAN FREE TRADE AGREEMENT (JUN 1997)
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (DEC 2003)
52.227-4	PATENT INDEMNITY-CONSTRUCTION CONTRACTS (APR 1984)
52.242-13	BANKRUPTCY (JUL 1995)
52-244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS (JUL 2004)
952.203-70	WHISTLEBLOWER PROTECTION FOR CONTRACTOR EMPLOYEES (DEC 2000)
952.204-2	SECURITY (MAY 2002)
952.208-70	PRINTING (APR 1984)
952.217-70	ACQUISITION OF REAL PROPERTY (APR 1984)
952.227-82	RIGHTS TO PROPOSAL DATA (APR 1994)
970.5223-4	WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (DEC 2000)
970-5232-3	ACCOUNTS, RECORDS, AND INSPECTION (DEC 2000)
CRD M 442.1-1	DIFFERING PROFESSIONAL OPINIONS MANUAL FOR TECHNICAL ISSUES INVOLVING ENVIRONMENT, SAFETY AND HEALTH
CRD O 450.1A	ENVIRONMENTAL PROTECTION PROGRAM

9.19.2 Applicable to Subcontracts over \$2,000 Where the Davis-Bacon Act Applies

CLAUSE	TITLE
52.222-6	DAVIS-BACON ACT (FEB 1995)
52.222-7	WITHHOLDING OF FUNDS (FEB 1988)
52.222-8	PAYROLLS AND BASIC RECORDS (NOV 2009)
52.222-9	APPRENTICES AND TRAINEES (FEB 1988)
52.222-10	COMPLIANCE WITH COPELAND REGULATIONS (FEB 1988)
52.222-11	SUBCONTRACTS LABOR STANDARDS (FEB 1988)
52.222-12	CONTRACT TERMINATION-DEBARMENT (FEB 1988)
52.222-13	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
52.222-14	DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
52.222-15	CERTIFICATION OF ELIGIBILITY (FEB 1988)
52.222-16	APPROVAL OF WAGE RATES (FEB 1988)
53.222(e)	APPLICATION OF LABOR LAWS TO GOVERNMENT ACQUISITIONS
952.222-39	NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES (DEC 2004)

CLAUSE	TITLE
970.5223-1	INTEGRATION OF ENVIRONMENT, SAFETY AND HEALTH INTO WORK PLANNING AND EXECUTION

9.19.3 Applicable to Subcontracts over \$2,500

CLAUSE	TITLE
52.222-3	CONVICT LABOR (JUN 2003)

9.19.4 Applicable to Subcontracts over \$2,500 Where the Service Contract Act Applies

CLAUSE	TITLE
52.222-41	SERVICE CONTRACT ACT OF 1965, AS AMENDED (MAY 1989)

9.19.5 Applicable to Subcontracts over \$3,000

CLAUSE	TITLE
52.222-54	EMPLOYMENT ELIGIBILITY VERIFICATION

9.19.6 Applicable to Subcontracts over \$10,000

CLAUSE	TITLE
52.222-21	PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)
52.222-26	EQUAL OPPORTUNITY (APR 2002)
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

9.19.7 Applicable to Subcontracts over \$25,000

CLAUSE	TITLE
52.222-35	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)

9.19.8 Applicable to Subcontracts over \$100,000

CLAUSE	TITLE	INSTRUCTIONS
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)	
52.203-7	ANTI-KICKBACK PROCEDURES (JUL 1995)	Add to (c)(2): "Seller shall notify Buyer when such action has been taken." In the first sentence of (c)(4) 'the Contract Officer may...' is replaced by 'after the Contracting Officer has effected an offset at the prime contract level or has directed Buyer to withhold any sum from the Seller, Buyer shall...'
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)	
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 2003)	

CLAUSE	TITLE	INSTRUCTIONS
52.215-2	AUDIT AND RECORDS – NEGOTIATIONS (JUNE 1999)	
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2001)	
52.222-4	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT – OVERTIME COMPENSATION (SEP 2000)	
52.223-14	TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)	
52.227-1	AUTHORIZATION AND CONSENT (JUL 1995)	
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)	

9.19.9 Applicable to Subcontracts over \$500,000

CLAUSE	TITLE
52.230-6	ADMINISTRATION OF COST ACCOUNTING STANDARDS (NOV 1999) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)
952.226-74	DISPLACED EMPLOYEE HIRING PREFERENCE (JUNE 1997)
970.5226-2	WORKFORCE RESTRUCTURING UNDER SECTION 3161 OF THE NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1993 (DEC 2000)
52.219-9	SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) ALTERNATIVE II (OCT 2001) Threshold for Construction is \$1,000,000. (Does not apply to small business or those instances where subcontracting opportunities are not available at the time of award.)

9.19.10 Applicable to Subcontracts over \$550,000

CLAUSE	TITLE
52.215-10	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)
52.215-11	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-13	SUBCONTRACTOR COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-15	PENSION ADJUSTMENTS AND ASSET REVERSIONS (JAN 2004)
52.215-18	REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)
52.215-19	NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

9.19.11 Applicable to Subcontracts over \$650,000

CLAUSE	TITLE
52.230-2	COST ACCOUNTING STANDARDS (APR 1998) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)

9.19.12 Applicable to Subcontracts Where Nuclear Hazards May Exist

CLAUSE	TITLE
952.223-75	PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)
952.250-70	NUCLEAR HAZARDS INDEMNITY AGREEMENT (OCT 2005)

9.19.13 Applicable to Subcontracts Where Government Property is Provided

CLAUSE	TITLE
52.244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS) (MAY 2004)
52.244-1	PROPERTY RECORDS (APR 1984) (Only applicable when WCH maintains the official property records.)
52.245-25	LIMITATION OF LIABILITY – SERVICES (FEB 1997)
952-244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-MATERIAL, OR LABOR-HOUR CONTRACTS)

9.19.14 Applicable to Subcontracts Where Technical Data or Computer Software will be Produced, Furnished or Acquired

CLAUSE	TITLE
52.227-14	RIGHTS IN DATA GENERAL (JUNE 1987) ALTERNATIVE V (JUNE 1987) AS MODIFIED PURSUANT TO DEAR 927.409 (a)

9.19.15 Applicable to Cost Reimbursement Subcontracts

CLAUSE	TITLE	INSTRUCTIONS
52.216-7	ALLOWABLE COST AND PAYMENT (DEC 2002)	(a) (3) 30 days
52.216-8	FIXED FEE (MAR 1997)	
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)	
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)	
52.244-2	SUBCONTRACTS (AUG 1998) – ALTERNATE II (AUG 1998)	
952.216-7	ALLOWABLE COST AND PAYMENT (JAN 1997) – ALTERNATE II	
952.251-70	CONTRACTOR EMPLOYEE TRAVEL DISCOUNTS (JUNE 1995)	
970.5204-3	ACCESS TO AND OWNERSHIP OF RECORDS (DEC 2000)	(b)(1) through (b)(5) are Subcontractor-owned records.

9.19.16 Applicable to Time and Material Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002)
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)

9.19.17 Applicable to Labor-Hour Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002) ALTERNATE II (FEB 2002)
52.242-15	STOP-WORK ORDER (AUG 1989) - ALTERNATE I (APR 1984)

///

EXHIBIT A

CONSTRUCTION SUBCONTRACTS GENERAL CONDITIONS

DO NOT ALTER THIS DOCUMENT

REV.	DATE	Explanation	Originator	Checker
07	December 31, 2009	Initiate E-Verify Requirements in FAR Clauses	L. Cortez	R. M. Harrison
06	July 7, 2009	Correction of Typographical Error	L. Cortez	D. Houston
River Corridor Closure Project			Subcontractor Terms & Conditions	

EXHIBIT "A"

WASHINGTON CLOSURE HANFORD, LLC

CONSTRUCTION SUBCONTRACTS

GENERAL CONDITIONS

WASHINGTON CLOSURE HANFORD LLC

EXHIBIT "A"

TABLE OF CONTENTS

1.0 SCOPE..... 1

2.0 STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES..... 1

3.0 DEFINITIONS..... 1

4.0 ENTIRE AGREEMENT 1

5.0 SUBCONTRACT INTERPRETATION 2

6.0 ORDER OF PRECEDENCE 2

7.0 THE SUBCONTRACTOR 2

GC 7.1 Independent Contractor 2

GC 7.2 Permits and Licenses..... 2

GC 7.3 Labor, Personnel, and Site Work Rules or WCH Policy 3

GC 7.4 Hanford Site Training 3

GC 7.5 Security 3

GC 7.6 Environment, Safety and Health 6

GC 7.7 Site Conditions and Natural Resources..... 7

GC 7.8 Differing Site Conditions 8

GC 7.9 Environmental Conditions 8

GC 7.10 Cultural Resources Awareness 9

GC 7.11 Worker Safety and Health Program (Civil Penalties Under 10 CFR 851 9

GC 7.12 Survey Control Points and Layouts 10

GC 7.13 SUBCONTRACTOR'S Work Area..... 10

GC 7.14 Cleaning Up 10

GC 7.15 Responsibility for Security of Work and Property 10

GC 7.16 SUBCONTRACTOR'S Plant, Equipment, and Facilities 11

GC 7.17 Illumination..... 12

GC 7.18 Use of CONTRACTOR's Construction Equipment or Facilities 12

GC 7.19 Warranty 12

GC 7.20 Inspection, Quality Surveillance, Rejection of Materials and Workmanship 13

GC 7.21 Testing 13

GC 7.22 Expediting 13

GC 7.23 Progress 14

GC 7.24 Excusable Delays 14

GC 7.25 Cooperation with Others 14

GC 7.26 Use of Completed Portions of Work 14

GC 7.27 Suspension 15

GC 7.28 Commercial Activities 16

GC 7.29 Publicity and Advertising 16

GC 7.30 Quality Assurance Program..... 16

GC 7.31 SUBCONTRACTOR Employee Concerns Program 16

GC 7.32 Workers Compensation Requirements 17

GC 7.33 Insurance 17

8.0 THE CONTRACTOR..... 21

GC 8.1 Authorized Representatives..... 21

GC 8.2 Medical Examinations 22

GC 8.3 First Aid Facilities 22

GC 8.4 Notices 22

GC 8.5 Changes..... 22

GC 8.6 Final Inspection and Acceptance..... 23

GC 8.7 Emergency Situation..... 24

9.0 GENERAL SUBCONTRACT PROVISIONS 24

GC 9.1 Applicable Law 24

GC 9.2 Words and Phrases 24

GC 9.3	Taxes	25
GC 9.4	Backcharges	25
GC 9.5	Examination of SUBCONTRACTOR's Record's and Accounts.....	26
GC 9.6	Title to Materials Found	26
GC 9.7	Termination for Default	26
GC 9.8	Termination for Convenience.....	27
GC 9.9	Non-Waiver	28
GC 9.10	Indemnity, Fines and Penalties	28
GC 9.11	Patent and Intellectual Property Indemnity.....	29
GC 9.12	Assignments and Subcontracts	29
GC 9.13	Survival	30
GC 9.14	Disputes.....	30
GC 9.15	Nondisclosure	30
GC 9.16	Procurement Integrity	31
GC 9.17	Rights in Data	31
GC 9.18	Continuity of Service.....	31
GC 9.19	Government Flowdowns	31

EXHIBIT "A"
CONSTRUCTION SUBCONTRACT GENERAL CONDITIONS

1.0 SCOPE

This Exhibit A provides General Terms and Conditions that apply to all Subcontracts providing Construction technical services to Washington Closure Hanford LLC.

2.0 STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES

- 2.1 Wherever references are made in this Subcontract to standards or codes in accordance with which the Work under this Subcontract is to be performed, the edition or revision of the standards or codes current on the effective date of this Subcontract shall apply unless otherwise expressly stated. If conflict occurs between any standards and codes referenced in the Subcontract Documents and any Subcontract Documents, the latter shall govern.
- 2.2 If SUBCONTRACTOR discovers any discrepancy or inconsistency between this Subcontract and any law, ordinance, statute, rule, regulation, order or decree, SUBCONTRACTOR shall report the same immediately, in writing, to CONTRACTOR who will issue such further instructions as may be necessary..
- 2.3 In performing Work under this Subcontract, the SUBCONTRACTOR shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), in effect at the time the work under this Subcontract is performed unless relief has been granted in writing by the appropriate regulatory agency.
- 2.4 If during the term of this Subcontract there are changed or new laws, ordinances, statutes, rules, regulations, orders or decrees not known or foreseeable at the time of signing this Subcontract that become effective and that affect the cost or time of performance of this Subcontract, SUBCONTRACTOR shall immediately notify CONTRACTOR in writing and submit detailed documentation of such effect in terms of both time and cost of performing the Subcontract. If the Work is affected by such changed or new laws, ordinances, etc., and CONTRACTOR concurs with the effect of such changes, an equitable adjustment in compensation and time of performance will be made, provided the OWNER approves such equitable adjustments in compensation and time of performance.

3.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH)

"SUBCONTRACTOR" means the legal entity which contracts with WCH.

"Subcontractor's Technical Representative" means the CONTRACTOR'S authorized representative.

"GOVERNMENT/OWNER" means the United States Government and/or the Department of Energy Richland Operations Office (DOE-RL).

4.0 ENTIRE AGREEMENT

This Subcontract embodies the entire agreement between the CONTRACTOR and SUBCONTRACTOR and supersedes all other writings. The parties shall not be bound by, or be liable for any statement, representation, promise, inducement, or understanding not set forth herein.

5.0 SUBCONTRACT INTERPRETATION

All questions concerning interpretation or clarification of this Subcontract, including the discovery of conflicts, errors or omissions, or the acceptable performance thereof by SUBCONTRACTOR, shall be immediately submitted in writing to the CONTRACTOR for resolution. All determinations, instructions, and clarifications of CONTRACTOR shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. At all times SUBCONTRACTOR shall proceed with the Work in accordance with the determinations, instructions, and clarifications of CONTRACTOR. SUBCONTRACTOR shall be solely responsible for requesting instructions or interpretations and shall be solely liable for any costs and expenses arising from its failure to do so.

6.0 ORDER OF PRECEDENCE

The Subcontract Agreement form or the Master Agreement form and individual Task Order Subcontracts, all documents listed therein, and subsequently issued Change Notices and modifications are essential parts of this Subcontract or Master Agreement and Task Order Subcontracts, and a requirement occurring in one is binding as though occurring in all. In resolving conflicts, discrepancies, errors, or omissions pursuant to the General Condition titled "SUBCONTRACT INTERPRETATION," the following order of precedence shall be used:

1. Subcontract Change Notices and Modifications, if any
2. Individual Task Order Subcontracts (which may include supplements to the Master Agreement)
3. The Subcontract Agreement Form or the Master Agreement Form
4. Exhibit "H" – Hanford Site Stabilization Agreement
5. Exhibit "C" – Schedule of Quantities and Prices
6. Exhibit "B" – Special Conditions
7. Exhibit "A" – General Conditions
8. Exhibit "G" – Subcontractor Safety and Health Requirements
9. Exhibit "J" – Subcontractor Environmental and Waste Management Requirements
10. Exhibit "K" – Integrated Work Control Program Procedure PAS-2-1.1 (if applicable)
11. Exhibit "D" – Scope of Work
12. Exhibit "F" – Drawings
13. Exhibit "E" – Technical Specifications
14. Exhibit "I" – Subcontractor Submittal Requirements Summary
15. Subcontractor Submittals

7.0 THE SUBCONTRACTOR

GC 7.1 Independent Contractor

SUBCONTRACTOR represents that it is fully experienced, properly qualified, registered, licensed, equipped, organized, and financed to perform the Work under this Subcontract. Subcontractor shall act as an independent contractor and not as the agent of CONTRACTOR or OWNER in performing this Subcontract, maintaining complete control over its employees and all of its lower-tier suppliers and subcontractors. Nothing contained in this Subcontract, or any lower-tier purchase order or subcontract awarded by SUBCONTRACTOR, shall create any contractual relationship between any lower-tier supplier or subcontractor and either CONTRACTOR or OWNER. SUBCONTRACTOR shall perform the Work hereunder in accordance with its own methods subject to compliance with the Subcontract.

GC 7.2 Permits and Licenses

Except as otherwise specified, SUBCONTRACTOR shall procure and pay for all permits, licenses, and inspections, other than inspections performed by CONTRACTOR and shall furnish any bonds, security, or deposits required by the Government, state, territory, municipality, or other political subdivision to permit performance of the Work hereunder. This includes, but is not necessarily limited to, identifying if such permits and licenses are required, compiling the information and data required for applications to obtain permits and licenses, filing of necessary applications for such permits and licenses, and providing any additional information or data required.

Where permits and licenses are furnished by the CONTRACTOR or OWNER, the SUBCONTRACTOR shall provide all reasonable assistance requested, including any necessary information or data.

GC 7.3 Labor, Personnel, and Site Work Rules or WCH Policy

- 7.3.1 Subcontractor shall comply with FAR Clause 52.222.54, "Employment Eligibility Verification." To comply, Subcontractor will enroll in E-Verify at www.dhs.gov/E-verify. Upon CONTRACTOR request, Subcontractor shall provide CONTRACTOR a copy of its "Maintain Company" page, printed directly from E-Verify.
- 7.3.2 SUBCONTRACTOR shall employ only competent and skilled personnel to perform the Work and shall remove from the Jobsite any SUBCONTRACTOR personnel determined by the CONTRACTOR to be unfit or to be acting in violation of any provision of this Subcontract, WCH, or Hanford Site policies. SUBCONTRACTOR is responsible for maintaining labor relations in such a manner that there is harmony among workers and shall comply with and enforce Jobsite procedures, regulations, and site work rules or WCH policy established by CONTRACTOR and OWNER.
- 7.3.3 SUBCONTRACTOR shall, to the extent permissible under applicable law, comply with the provisions of all labor agreement(s), inclusive of the Hanford Site Stabilization Agreement, which apply to the Work performed under this Subcontract (e.g., Project Agreement, collective bargaining agreement(s), etc.). SUBCONTRACTOR shall pay rates of wages and shall observe hours of Work and other economic terms and conditions of employment equivalent to those paid and observed by CONTRACTOR, all of which shall be subject to CONTRACTOR'S approval.
- 7.3.4 Work assignments and the settlement of jurisdictional disputes shall conform with either the Rules, Regulations, and Procedures of the Plan for Settlement of Jurisdictional Disputes in the Construction Industry, and any successor agreement thereto, or any other mutually established method of determining work assignments and settling jurisdictional disputes.

GC 7.4 Hanford Site Training

In the performance of work under this Subcontract, SUBCONTRACTOR shall adhere to all the training requirements as outlined and stipulated under Exhibit "G", Subcontractor Safety and Health Requirements. SUBCONTRACTOR is responsible for all labor costs for employees receiving training. SUBCONTRACTOR is also responsible for tuition costs for initial and annual refresher Radworker II training. SUBCONTRACTOR is responsible for all scheduling and coordination for Radworker II training. Additionally, SUBCONTRACTOR will be responsible for all costs incurred by CONTRACTOR for failure to report (no shows) to any scheduled training by SUBCONTRACTOR'S personnel and lower-tiers. All scheduling of HGET shall be given to STR at least two weeks in advance of the HGET training needed.

GC 7.5 Security

- 7.5.1 In the performance of the Work under this Subcontract, SUBCONTRACTOR shall comply with the following requirements from the CONTRACTOR/OWNER security program:
- 7.5.1.1 Incidents. Prompt verbal notification of incidents of loss, theft, vandalism, violence, threats, and misconduct to the CONTRACTOR, subsequently detailed in a written report.
- 7.5.1.2 Prohibited Articles. Property passes are required for the movement of prohibited articles into and out of any areas of the Hanford Site. Prohibited articles include:
- Dangerous weapons
 - Explosives, ammunition, and incendiary devices.
 - Controlled substances and drug paraphernalia.
 - Alcoholic beverages.
 - Contraband (includes other items prohibited by law).

- (a) The SUBCONTRACTOR will notify the CONTRACTOR if it becomes necessary to transport prohibited articles onto the Hanford Site. Upon CONTRACTOR and OWNER approval, the CONTRACTOR will issue the appropriate property pass. SUBCONTRACTOR employees transporting prohibited articles within the Hanford Site must have a valid property pass in their possession.
- (b) SUBCONTRACTOR employees and employees of its lower-tier subcontractors discovered on the Hanford Site in possession of any prohibited article, and not in possession of a valid property pass, shall have their badge and prohibited article returned to the OWNER and their access to the Hanford Site suspended. If it is legally allowable for the individual to possess the prohibited article, the badge and prohibited article will be returned within two working days. If it is illegal for the individual to possess the prohibited article, the prohibited article will be turned over to local law enforcement and the individual's access to the Hanford Site will be denied for a minimum of one (1) year.

7.5.1.3 Security Badges. Any person assigned to work on the Hanford Site or any designated CONTRACTOR facility shall be required to wear a CONTRACTOR issued security badge identifying him/her. If any such persons are foreign nationals, special procedures shall apply when applying for and receiving a security badge. The identification badge shall be worn in plain view, above the waist, on the front of the body, on the outer most layer of clothing. If required, a dosimeter will be issued in conjunction with the security badge.

- (a) Badging for more than seven (7) days requires SUBCONTRACTOR employees, and employees of their lower-tier subcontractors, vendors, and visitors to complete Hanford General Employee Training (HGET).
- (b) SUBCONTRACTOR shall provide to CONTRACTOR the individual(s) complete name (as it appears on the photo identification to be used), name and address of the company being represented, reason for access, social security number, date of birth (mm/dd/yyyy), place of birth (city, state/province, country), and citizenship of the individual(s) requiring a badge at least two (2) working days prior to the date the employee(s) first require the badge(s) for work performance.
- (c) It is the responsibility of the SUBCONTRACTOR to provide the CONTRACTOR with a minimum of two (2) weeks notice if the SUBCONTRACTOR will be requesting access to the work site for a foreign national. This will extend to six (6) weeks notice if the foreign national is from a sensitive country as defined by the OWNER.
- (d) Badges will be issued by CONTRACTOR at locations and according to schedules provided by the CONTRACTOR. Central Badging Office hours are normally 7:00 a.m. through 4:30 p.m., Monday through Thursday, and 7:00 a.m. through 3:30 p.m., Friday. CONTRACTOR temporary badging hours are normally 6:30 a.m. through 5:00 p.m., Monday through Thursday.
- (e) The employee, vendor, or visitor must appear in person to obtain a badge. Badge applicants must provide proof of identification and completion of HGET to the issuing office.
- (f) The OWNER will issue security badges free of charge.
- (g) Security badges will be valid only for the duration of a specific Subcontract or for one (1) calendar year from the date of issuance, whichever ends first. If a Subcontract extends beyond one (1) year, SUBCONTRACTOR employees must obtain a new badge prior to the expiration date of the current badge.
- (h) A new security badge must be obtained whenever there is a significant change in facial appearance, e.g., growth or removal of facial hair, changes resulting from surgery, etc.

- (i) U.S. Department of Energy (DOE) security badges are the property of the Government and must be returned to the CONTRACTOR whenever an individual is transferred, terminates employment or otherwise no longer requires the badge. Badges of departing visitors shall be turned over to CONTRACTOR or security force personnel at the conclusion of the visit at the final security checkpoint. It is the responsibility of the SUBCONTRACTOR to implement a Badge Recovery Policy to ensure its employees, vendors and sub-tier personnel:
 - § Report a lost or stolen badge to the CONTRACTOR'S representative within twenty-four (24) hours of discovery,
 - § Return the security badge to the CONTRACTOR when no longer valid or when requested to by CONTRACTOR, OWNER, and/or protective (security) force personnel.
- (j) A charge of \$1,000.00 will be assessed to the SUBCONTRACTOR for each security badge that is not returned. Such charges will be deducted from payments otherwise due the SUBCONTRACTOR. Refund of charges, previously collected for badges and/or dosimeters subsequently found may not be made after the date of final payment to the SUBCONTRACTOR.
- (k) The SUBCONTRACTOR is responsible for all labor costs associated with the badging and security training requirements.

7.5.1.4 Security Orientation. Each SUBCONTRACTOR visitor/vendor, and visitor/vendors of their lower-tier subcontractors, will receive a security orientation booklet from the CONTRACTOR or OWNER prior to being issued a visitor security badge.

7.5.1.5 Computer Security. Each SUBCONTRACTOR employee, and employees of their lower-tier subcontractors that are granted access to the CONTRACTOR or OWNER information networks, are required to adhere to the restrictions and limitations of the CONTRACTOR computer security program. These requirements can be obtained from the CONTRACTOR Computer Protection Program Manager.

7.5.1.6 "Official Use Only" Information Security. Each SUBCONTRACTOR employee, and employees of their subcontractors that are granted access to "Official Use Only" sensitive unclassified information provided by the CONTRACTOR/OWNER of the information must adhere to the restrictions and limitations of the CONTRACTOR regarding the access, control, and destruction of the information. These requirements include ensuring that any SUBCONTRACTOR employee or employees of their subcontractors having access to the information meet the following requirements:

- (a) The employee granted access to the information has a need to know.
- (b) Advise the employee not to divulge the information to persons who do not have a need to know.
- (c) Provide protection against theft or unauthorized removal/distribution of the information.
- (d) When use of the information is completed, any documents or data shall be destroyed by shredding in accordance with established procedures.

7.5.1.7 A Security Program Plan shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any even prior to commencing Work at the Jobsite. The Program Plan shall include a description of how the SUBCONTRACTOR will implement the applicable requirements of this section and the additional requirements below.

- (a) Controlled access to office, warehouse, material and equipment sites.
- (b) Accountability procedures for the requisition and issue of materials.
- (c) Periodic security checks for all work areas assigned to SUBCONTRACTOR.
- (d) Prompt reporting of incidents of loss, theft, or vandalism to CONTRACTOR, subsequently detailed in writing.
- (e) Coordination and compliance with Site security programs.

7.5.2 The written Security Program Plan is set forth in Exhibit I and is a required Subcontractor Submittal.

7.5.3 Security of Work. SUBCONTRACTOR shall, at all times, conduct all operations under this Subcontract in a manner to avoid the risk of loss, theft, or damage by vandalism, sabotage, or any other means to any work, materials, equipment, or other property at the Jobsite. SUBCONTRACTOR shall continuously inspect all Work, materials and equipment to discover and determine any conditions that might involve such risks and shall be solely responsible for discovery, determination, and correction of any such conditions.

7.5.4 SUBCONTRACTOR shall comply with CONTRACTOR'S security requirements for the Jobsite. SUBCONTRACTOR shall cooperate with CONTRACTOR on all security matters and shall promptly comply with any project security arrangements established by CONTRACTOR or OWNER. Such compliance with these security requirements shall not relieve SUBCONTRACTOR of its responsibility for maintaining proper security for the above-noted items, nor shall it be construed as limiting in any manner SUBCONTRACTOR'S obligation with respect to all applicable laws and regulations and to undertake reasonable action to establish and maintain security conditions at the Jobsite.

7.5.5 The CONTRACTOR may also require that the SUBCONTRACTOR be removed from the job, at no additional cost to CONTRACTOR, employees who endanger persons or property, disruptive to the workforce, or whose continued employment under this Subcontract is inconsistent with the requirements of the Subcontract and/or interests of safety or security at the Hanford Site.

GC 7.6 Environment, Safety and Health

CONTRACTOR sets forth its full requirements for environment, safety and health in Exhibit "G", "Subcontractor Safety and Health Requirements," and Exhibit "J", "Subcontractor Environmental and Waste Management Requirements." These Exhibits, if included in this Subcontract, are fully integrated and a part hereof. The contents of Exhibit "G" and Exhibit "J" notwithstanding, the following applies to this Subcontract:

7.6.1 SUBCONTRACTOR shall be fully and solely responsible for conducting all operations under this Subcontract at all times in such a manner as to avoid the risk of harm to the environment, persons and/property. SUBCONTRACTOR shall continually and diligently inspect all Work, materials, and equipment to discover any conditions that might involve such risks and shall be solely responsible for discovery and correction of any such conditions.

7.6.2 SUBCONTRACTOR shall comply with CONTRACTOR'S Safety and Health Requirements including its Integrated Safety Management System (ISMS) Plan. SUBCONTRACTOR shall have sole responsibility for implementing its safety program. All of SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this General Condition titled "ENVIRONMENT, SAFETY AND HEALTH."

7.6.3 Neither CONTRACTOR nor OWNER shall be responsible for supervising the implementation of SUBCONTRACTOR'S safety program, and neither CONTRACTOR nor OWNER shall have responsibility for the safety of SUBCONTRACTOR'S or its lower-tier suppliers' or subcontractors' employees.

7.6.4 SUBCONTRACTOR'S failure to correct an unsafe condition or unsafe act or condition or act that negatively impacts the environment by its personnel after notice thereof shall be grounds for:

- (a) An order to suspend the affected operations until the unsafe condition is corrected and,
- (b) If the violation continues, default termination of this Subcontract for such failure under the clause entitled, "Termination for Default," below.

7.6.5 SUBCONTRACTOR shall designate one or more (as appropriate) Environmental, Safety and Health (ES&H) Representatives(s) acceptable to CONTRACTOR who shall be resident at the Jobsite, have responsibility to correct unsafe conditions or unsafe acts, act on behalf of SUBCONTRACTOR on environment, health and safety matters, and participate in periodic environment, safety and health meetings with CONTRACTOR. SUBCONTRACTOR shall instruct its personnel on the CONTRACTOR'S Health and Safety Requirements and SUBCONTRACTOR'S safety program and shall coordinate with other subcontractors on safety matters.

7.6.6 SUBCONTRACTOR shall furnish safety equipment and enforce the use of such equipment by its employees.

7.6.7 SUBCONTRACTOR shall maintain accident, injury, and any other records required by applicable laws and regulations (e.g., OSHA, etc.) or by CONTRACTOR and shall furnish CONTRACTOR a monthly summary of injuries and labor hours lost due to injuries.

GC 7.7 Site Conditions and Natural Resources

7.7.1 SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the nature and location of the Work and the general and local conditions, including, but not limited to, the following:

- (a) Transportation, access, disposal, and handling and storage of materials.
- (b) Availability and quality of labor, water, electric power and road conditions.
- (c) Climatic conditions, tides, and seasons.
- (d) River hydrology and river stages.
- (e) Physical conditions at the Jobsite and the project area as a whole.
- (f) Topography and ground surface conditions.
- (g) Equipment and facilities needed preliminary to and during the performance of the Work.
- (h) Radiological conditions of surface or subsurface.

7.7.2 The failure of SUBCONTRACTOR to acquaint itself with any applicable conditions will not relieve SUBCONTRACTOR of the responsibility for properly estimating either the difficulties or the cost of successfully performing SUBCONTRACTOR'S obligations under this Subcontract.

7.7.3 Where CONTRACTOR or OWNER has made investigations of subsurface conditions in areas where Work is to be performed under this Subcontract, such investigations are made by CONTRACTOR and OWNER for the purpose of study and design. If the records of such investigation are included in the Subcontract Documents, the interpretation of such records shall be the sole responsibility of SUBCONTRACTOR. Neither CONTRACTOR nor OWNER assumes any responsibility whatsoever in respect to the sufficiency or accuracy of such investigations, the records thereof, or of the interpretations set forth; and there is no warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such proportions different from those indicated may not be encountered.

GC 7.8 Differing Site Conditions

7.8.1 The Hanford Site was used for nuclear work related to the production of weapons for the defense of the country. Unidentified sources of radioactive material exist in Hanford Site soil. SUBCONTRACTOR shall promptly notify CONTRACTOR, in writing, before proceeding with any Work that SUBCONTRACTOR believes constitutes a differing site condition with respect to:

- (a) Subsurface or latent physical conditions at the Jobsite differing materially from those indicated in this Subcontract, or
- (b) Previously unknown physical conditions at the Jobsite, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Subcontract, or

7.8.2 CONTRACTOR will, as promptly as practicable, investigate such conditions and make a determination. If CONTRACTOR determines that such conditions do materially so differ and cause an increase or decrease in SUBCONTRACTOR'S cost of or the time required for performance of the Work under the Subcontract, an adjustment will be made and the Subcontract modified, in writing, accordingly. No claim of SUBCONTRACTOR under this clause will be allowed unless SUBCONTRACTOR has given the required notice.

GC 7.9 Environmental Conditions

7.9.1 Throughout performance of the Work, SUBCONTRACTOR shall conduct all operations in such a way as to minimize impact upon the natural environment and prevent any spread of contaminated or hazardous material. SUBCONTRACTOR shall provide:

- (a) Dust control of its operations within work and all other areas under its control and shall coordinate and cooperate with others for dust control in common areas.
- (b) Working machinery and equipment with efficient noise suppression devices and all other noise and vibration abatement measures necessary for the protection of workers and the public.
- (c) Suitable waste, sewage, sanitary, and garbage disposal methods and procedures approved by CONTRACTOR.
- (d) Provide suitable equipment, facilities, and precautions to prevent the discharge of contaminants into the atmosphere, any body of water, or land areas.
- (e) All documentation required by all levels of governing authority of this Subcontract concerning environmental requirements.
- (f) Responsibility for developing and maintaining a written Environmental Compliance Plan in accordance with SUBCONTRACTOR'S established practices, including, but not limited to, compliance with all applicable laws and all applicable requirements in the Project Environmental Control Plan. SUBCONTRACTOR shall have sole responsibility for developing, implementing, and enforcing its Environmental Compliance Plan and SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this clause.

7.9.2 SUBCONTRACTOR shall submit its written Environmental Compliance Plan to CONTRACTOR for review before commencing work at the Jobsite. The plan shall be submitted in accordance with Exhibit I and shall include all elements set forth in Exhibit J. CONTRACTOR'S review of SUBCONTRACTOR'S Plan shall not relieve SUBCONTRACTOR of its obligation under this Subcontract or as imposed by law, and SUBCONTRACTOR shall be solely responsible for the adequacy of its Environmental Compliance Plan.

7.9.3 If SUBCONTRACTOR encounters material on the Jobsite reasonably believed to be toxic or hazardous material or waste, which has not been addressed in this Subcontract, SUBCONTRACTOR shall

immediately stop work in the affected area and notify CONTRACTOR and OWNER of the condition. Pending receipt of written instructions from CONTRACTOR, SUBCONTRACTOR shall not resume work in the affected area.

GC 7.10 Cultural Resources Awareness

- 7.10.1 SUBCONTRACTOR shall comply with the provisions of the Native American Graves Protection Act 25 USC 3001-3013. This act establishes statute provisions for the treatment of Native American remains and cultural objects. If during the performance of this Subcontract, SUBCONTRACTOR discovers Native American remains and/or cultural objects, SUBCONTRACTOR shall immediately cease work in the affected work area, take reasonable efforts to protect the items discovered, and notify the CONTRACTOR'S STR. Work in the affected area may be prohibited for a period not to exceed thirty (30) calendar days. Cessation of work under the provisions of this article for periods of up to thirty (30) calendar days shall not be cause for an excusable delay.
- 7.10.2 Cultural resources are known to exist on the Hanford Reservation. The SUBCONTRACTOR shall use previously disturbed areas, whenever possible, while conducting work activities. The SUBCONTRACTOR shall also ensure workers are trained to recognize culturally significant resources. CONTRACTOR shall provide one (1) hour training for SUBCONTRACTOR employees on cultural resources awareness. SUBCONTRACTOR is responsible for all labor costs associated with this training. All workers shall be directed to visually inspect for cultural resources during all work activities, particularly in undisturbed areas. If any cultural resources are encountered, work in the vicinity of the discovery shall be suspended immediately. In the event of any such discoveries, the SUBCONTRACTOR shall notify the CONTRACTOR'S onsite representative immediately.

GC 7.11 Worker Safety and Health Program (Civil Penalties Under 10 CFR 851)

- 7.11.1 Section 3173 of Public Law 107-314, Bob Stump National Defense Authorization Act of Fiscal Year 2003 amends the Atomic Energy Act (AEA) by adding Section 234C, Worker Health and Safety Rules for Department of Energy Nuclear Facilities. The Department of Energy (DOE) promulgated Procedural Rules (10 CFR 851); Worker Safety and Health Program to comply with Section 234C. These rules govern the conduct of Contractor, Subcontractor and Supplier activities at DOE sites. Violation of the applicable rules will provide a basis for the assessment of civil penalties under the CFR ruling on Contractors, Subcontractors and Suppliers. Title 10 CFR 851 sets forth the procedures DOE (OWNER) will use in exercising its enforcement authority, including the issuance of "Notices of Violation" and the resolution of an administrative appeal in the event the Contractor or Subcontractor elects to petition the Office of Hearings and Appeals for Review.
- 7.11.2 This Subcontract or Purchase Order is subject to the requirements of 10 CFR 851, if under its terms the Supplier or Subcontractor is required to perform work at the Hanford Site.
- 7.11.3 DOE (OWNER) may assess civil penalties of up to \$70,000 per violation per day. If any violation is a continuing violation, each day of the violation shall constitute a separate violation for the purpose of computing the civil penalty.
- A. A Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists or from one or more practices, means, methods, operations or processes which have been adopted or are in use, in such a place of employment. Severity Level I violation would be subject to the base civil penalty of up to 100% of the maximum base civil penalty of \$70,000.
- B. A Severity Level II violation is an other than serious violation. An other than serious violation occurs where the most serious injury or illness that would potentially result from a hazardous condition cannot be reasonably predicted to cause death or serious physical harm to employees but does have a direct relationship to their safety and health. A Severity Level II violation would be subject to the base civil penalty of up to 50% of the maximum base civil penalty or \$35,000.

- 7.11.4 Indemnification of Contractor (WCH). To the extent permitted by law, Subcontractor or Supplier assumes full responsibility and shall indemnify, hold harmless and defend WCH and its principal subcontractors, their agents, officers, employees, and directors from any civil liability under Section 234C of the Act or the implementing regulations at 10 CFR 851, arising out of the activities of the SUBCONTRACTOR or Supplier, its lower tier subcontractors, suppliers, agents, employees, officers or directors to the extent that the action or inaction of the Subcontractor or Supplier is found to be a direct or indirect cause of the assessment of fines or penalties or the cause of the institution of proceedings against WCH under Sections 234C of the Act. The Subcontractor's or Supplier's obligation to indemnify and hold harmless shall expressly include attorney's fees and other reasonable costs of defending any action or proceeding instituted under Section 234C of the Act of the implementing regulations at 10 CFR 851. A copy of the implementing regulations at 10 CFR 851 will be made available to the Subcontractor or Supplier upon request.
- 7.11.5 The contents of this article are to be flowed down to all sub-tier subcontractors and suppliers at any level who will perform work at the Hanford Site.

GC 7.12 Survey Control Points and Layouts

- 7.12.1 Survey control points, as shown on the drawings, will be established by CONTRACTOR.
- 7.12.2 SUBCONTRACTOR shall complete the layout of all Work and shall be responsible for all requirements necessary for the Work execution in accordance with the locations, lines, and grades specified or shown on the drawings, subject to such modifications as CONTRACTOR may require as Work progresses.
- 7.12.3 If SUBCONTRACTOR or any of its lower-tier subcontractors or any of their representatives or employees move or destroy or render inaccurate any survey control point, such control point shall be replaced by CONTRACTOR at SUBCONTRACTOR'S expense. No separate payment will be made for survey Work performed by SUBCONTRACTOR.

GC 7.13 SUBCONTRACTOR'S Work Area

All SUBCONTRACTOR Work areas on the Jobsite will be assigned by CONTRACTOR. SUBCONTRACTOR shall confine its operations to the areas so assigned. Should SUBCONTRACTOR find it necessary or advantageous to use any additional off-site area for any purpose whatsoever, SUBCONTRACTOR shall, at its expense, provide and make its own arrangements for the use of such additional off-site areas.

GC 7.14 Cleaning Up

- 7.14.1 SUBCONTRACTOR shall, at all times, keep its Work areas in a neat, clean, and safe condition.
- 7.14.2 Upon completion of any portion of the Work, SUBCONTRACTOR shall promptly remove from the Work area all its equipment, construction plant, temporary structures, and surplus materials not to be used at or near the same location during later stages of the Work.
- 7.14.3 Upon completion of the Work and before final payment, SUBCONTRACTOR shall, at its expense, satisfactorily dispose of all rubbish, remove all plant, buildings, equipment, and materials belonging to SUBCONTRACTOR and return to CONTRACTOR'S warehouse or Jobsite storage area all salvageable CONTRACTOR- or OWNER-supplied materials. SUBCONTRACTOR shall leave the premises in a neat, clean, and safe condition.
- 7.14.4 If SUBCONTRACTOR fails to comply with the foregoing, CONTRACTOR will accomplish same at SUBCONTRACTOR'S expense.

GC 7.15 Responsibility for Security of Work and Property

- 7.15.1 Work in Progress, Materials and Equipment. SUBCONTRACTOR shall be responsible for and shall bear any and all risk of loss of or damage to Work in progress, all materials delivered to the Jobsite,

and all materials and equipment until completion and final acceptance of the Work under this Subcontract.

7.15.2 Delivery, Unloading and Storage. SUBCONTRACTOR'S responsibility for materials and plant equipment required for the performance of this Subcontract shall include:

- (a) Receiving and unloading.
- (b) Storing in a secure place and in a manner subject to CONTRACTOR'S review. Outside storage of materials and equipment subject to degradation by the elements shall be in weather-tight enclosures provided by SUBCONTRACTOR.
- (c) Delivering from storage to construction site all materials and plant equipment as required.
- (d) Maintaining complete and accurate records for CONTRACTOR'S inspection of all materials and plant equipment received, stored, and issued for use in the performance of the Subcontract.

7.15.3 Property. SUBCONTRACTOR shall plan and conduct its operations so as not to:

- (a) Enter upon lands in their natural state unless authorized by CONTRACTOR.
- (b) Damage, close, or obstruct any utility installation, highway, road, or other property until permits have been obtained.
- (c) Disrupt or otherwise interfere with the operation of any pipeline, telephone, electric transmission line, ditch, or structure unless otherwise specifically authorized by this Subcontract.
- (d) Damage or destroy cultivated and planted areas, and vegetation such as trees, plants, shrubs, and grass on or adjacent to the premises which, as determined by CONTRACTOR, do not interfere with the performance of this Subcontract. This includes damage arising from performance of Work by operating equipment or stockpiling materials.

SUBCONTRACTOR shall not be entitled to any extension of time or compensation on account of SUBCONTRACTOR'S failure to protect all materials, equipment, and environment, as described herein. All costs in connection with any repairs or restoration necessary or required by reason of unauthorized obstruction, damage, or use shall be borne by SUBCONTRACTOR.

GC 7.16 SUBCONTRACTOR'S Plant, Equipment, and Facilities

7.16.1 SUBCONTRACTOR shall provide and use for the Work hereunder only such construction plant and equipment as are capable of producing the quality and quantity of Work and materials required by this Subcontract and within the time or times specified in the Subcontract Schedule.

7.16.2 Before proceeding with the Work hereunder, SUBCONTRACTOR shall furnish CONTRACTOR with information and drawings relative to such equipment, plant and facilities as CONTRACTOR may request. Upon written order of CONTRACTOR, SUBCONTRACTOR shall discontinue operation of unsatisfactory plant, equipment, or facilities and shall either modify the unsatisfactory items or remove such items from the Jobsite.

7.16.3 SUBCONTRACTOR shall, at the time any equipment is moved onto the Jobsite, present to CONTRACTOR an itemized list of all equipment and tools, including, but not limited to, power tools, welding machines, pumps, and compressors. Said list must include description and quantity, and serial number where applicable. It is recommended that SUBCONTRACTOR identify its equipment by color (other than yellow), decal, and etching. Before removing any or all equipment, SUBCONTRACTOR shall clear such removal through CONTRACTOR.

7.16.4 SUBCONTRACTOR shall not remove construction plant, equipment, or tools from the Jobsite before the Work is finally accepted, without CONTRACTOR'S written approval. SUBCONTRACTOR shall

obtain CONTRACTOR'S radiological release of all equipment used in radiological areas before removal.

GC 7.17 Illumination

When any Work is performed at night or where daylight is obscured, SUBCONTRACTOR shall, at its expense, provide artificial light sufficient to permit Work to be carried on efficiently, satisfactorily, and safely, and to permit thorough inspection. During such time periods, the access to the place of Work shall also be clearly illuminated. All wiring for electric light and power shall be installed and maintained in a safe manner and meet all applicable codes and standards.

GC 7.18 Use of CONTRACTOR's Construction Equipment or Facilities

Where SUBCONTRACTOR requests CONTRACTOR and CONTRACTOR agrees to make available to SUBCONTRACTOR certain equipment or facilities belonging to CONTRACTOR for the performance of SUBCONTRACTOR Work under the Subcontract, the following shall apply:

- (a) Equipment or facilities will be charged to SUBCONTRACTOR at agreed rental rates.
- (b) CONTRACTOR will furnish a copy of the equipment maintenance and inspection record, and these records shall be maintained by SUBCONTRACTOR during the rental period.
- (c) SUBCONTRACTOR shall assure itself of the condition of such equipment and assume all risks and responsibilities during its use.
- (d) SUBCONTRACTOR shall, as part of its obligation under the General Condition clause titled "INDEMNITY," release, defend, indemnify, and hold harmless CONTRACTOR and OWNER from all claims, demands and liabilities arising from the use of such equipment.
- (e) CONTRACTOR and SUBCONTRACTOR shall jointly inspect such equipment before its use and upon its return. The cost of all necessary repairs or replacement for damage other than normal wear shall be at SUBCONTRACTOR'S expense.
- (f) If such equipment is furnished with an operator, the services of such operator will be performed under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than the payment of wages, Workers' Compensation Insurance, or other benefits.

GC 7.19 Warranty

- 7.19.1 SUBCONTRACTOR warrants to CONTRACTOR and OWNER that equipment and materials furnished under this Subcontract shall be new, of clear title, and of the most suitable grade of their respective kinds for their intended uses, unless otherwise specified. All workmanship shall be first class and performed in accordance with sound construction practices acceptable to CONTRACTOR. All equipment, materials, and workmanship shall also conform to the requirements of this Subcontract.
- 7.19.2 SUBCONTRACTOR warrants all equipment and material it furnishes and all work it performs against defects in design, equipment, materials, or workmanship either for a period from Work commencement to a date twelve (12) months after Final Acceptance of the Project as a whole by OWNER or the standard commercial warranty period, whichever is more advantageous to the CONTRACTOR.
- 7.19.3 If at any time during the warranty period, CONTRACTOR, OWNER, or SUBCONTRACTOR discover any defect in the design, equipment, materials, or workmanship, immediate notice shall be given to the other parties, SUBCONTRACTOR shall, within a reasonable time, propose corrective actions to cure such defects to meet the requirements of this Subcontract.
- 7.19.4 CONTRACTOR, at its sole discretion, may direct SUBCONTRACTOR in writing and SUBCONTRACTOR agrees to:

- (a) Rework, repair, or remove and replace defective equipment and materials or re-perform defective workmanship to acceptable quality at a time and in a manner acceptable to CONTRACTOR.
- (b) Cooperate with others assigned by CONTRACTOR to correct such defects and pay to CONTRACTOR all actual costs reasonably incurred by CONTRACTOR in performing or in having performed corrective actions.
- (c) Propose and negotiate in good faith an equitable reduction in the Subcontract price in lieu of corrective action.

7.19.5 All costs incidental to corrective actions, including demolition for access, removal, disassembly, transportation, reinstallation, reconstruction, retesting, and reinspection, as may be necessary to correct the defect and to demonstrate that the previously defective work conforms to the requirements of this Subcontract, shall be borne by SUBCONTRACTOR.

7.19.6 SUBCONTRACTOR further warrants any and all corrective actions it performs against defects in design, equipment, materials, and workmanship for an additional period of twelve (12) months following acceptance by CONTRACTOR of the corrected Work or standard commercial warranty on product meeting standard warranty.

GC 7.20 Inspection, Quality Surveillance, Rejection of Materials and Workmanship

7.20.1 All material and equipment furnished and Work performed shall be properly inspected by SUBCONTRACTOR at its expense, and shall at all times be subject to quality surveillance and quality audit by CONTRACTOR, OWNER, or their authorized representatives who shall be afforded full and free access to the shops, factories, or other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for such quality surveillance or audit. SUBCONTRACTOR shall provide safe and adequate facilities, drawings, documents, and samples as requested, and shall provide assistance and cooperation, including stoppage of Work to perform such examination (as may be necessary) to determine compliance with the requirements of this Subcontract. Any Work covered before any scheduled quality surveillance or test by CONTRACTOR or OWNER shall be uncovered and replaced at the expense of SUBCONTRACTOR. Failure of CONTRACTOR or OWNER to make such quality surveillance or to discover defective design, materials, or workmanship shall not relieve SUBCONTRACTOR of its obligations under this Subcontract nor prejudice the rights of CONTRACTOR or OWNER thereafter to reject or require the correction of defective Work in accordance with the provisions of this Subcontract.

7.20.2 If any Work is determined by CONTRACTOR or OWNER to be defective or not in conformance with this Subcontract, the provisions of the General Condition clause titled "WARRANTY" shall apply.

GC 7.21 Testing

7.21.1 Unless otherwise provided in the Subcontract, testing of materials or Work shall be performed by SUBCONTRACTOR at its expense and in accordance with Subcontract requirements. Should tests (in addition to those required by this Subcontract) be desired by CONTRACTOR, SUBCONTRACTOR will be advised in ample time to permit such testing. Such additional tests will be at CONTRACTOR'S expense.

7.21.2 SUBCONTRACTOR shall furnish samples, as requested, and shall provide reasonable assistance and cooperation necessary to permit tests to be performed on materials or Work in place, including reasonable stoppage of Work during testing.

GC 7.22 Expediting

The material and equipment furnished and Work performed under this Subcontract shall be subject to expediting by CONTRACTOR or its representatives who shall be allowed full and free access to the shops, factories, and other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for expediting purposes.

As required by CONTRACTOR, SUBCONTRACTOR shall provide detailed schedules and progress reports for use in expediting and shall cooperate with CONTRACTOR in expediting activities.

GC 7.23 Progress

- 7.23.1 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR who shall thereupon take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the currently approved Subcontract Schedule, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of Work per week, and an increase in the amount of construction plant and equipment, all without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of Work and rate of progress required by this Subcontract.
- 7.23.2 Failure of SUBCONTRACTOR to comply with CONTRACTOR'S instructions may be grounds for determination by CONTRACTOR that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate, in accordance with the applicable provisions of this Subcontract, SUBCONTRACTOR'S right to proceed with the performance of the Subcontract.

GC 7.24 Excusable Delays

If SUBCONTRACTOR'S performance of this Subcontract is prevented or delayed by any unforeseeable cause, existing or future, which is beyond the reasonable control of the parties and without the fault or negligence of SUBCONTRACTOR, SUBCONTRACTOR shall, within twenty-four (24) hours of the commencement of any such delay, give to CONTRACTOR written notice thereof and within seven (7) calendar days of commencement of the delay, a written description of the anticipated impact of the delay on performance of the Work. Delays attributable to and within the control of SUBCONTRACTOR'S suppliers or subcontractors of any tier shall be deemed delays within the control of SUBCONTRACTOR. Radiological survey time to release personnel, materials, equipment or facilities from known radiological areas shall not be considered excusable delays. Within seven (7) calendar days after the termination of any excusable delay, SUBCONTRACTOR shall file a written notice with CONTRACTOR specifying the actual duration of the delay. Failure to give any of the above notices shall be sufficient ground for denial of an extension of time. If CONTRACTOR determines that the delay was unforeseeable, beyond the control and without the fault or negligence of SUBCONTRACTOR, CONTRACTOR will determine the duration of the delay and will extend the time of performance of this Subcontract by modifying the Special Condition clause titled "COMMENCEMENT, PROGRESS, AND COMPLETION OF THE WORK," accordingly. Such extension shall be the sole remedy for the delay.

GC 7.25 Cooperation with Others

The CONTRACTOR may undertake or award other Subcontracts for other work or services. CONTRACTOR, OWNER, and other contractors may be working at the Jobsite during the performance of this Subcontract and SUBCONTRACTOR Work or use of certain facilities may be interfered with as a result of such concurrent activities. SUBCONTRACTOR shall fully cooperate with the other subcontractors and with CONTRACTOR employees. CONTRACTOR reserves the right to require SUBCONTRACTOR to schedule the order of performance of the Work to minimize interference with Work of any of the parties involved. The SUBCONTRACTOR shall not commit any act that will interfere with the performance of work by any other subcontractor or by CONTRACTOR employees.

GC 7.26 Use of Completed Portions of Work

- 7.26.1 Whenever, as determined by CONTRACTOR, any portion of the Work performed by SUBCONTRACTOR is suitable for use, CONTRACTOR or OWNER may occupy and use such portion. Use shall not constitute acceptance, relieve SUBCONTRACTOR of its responsibilities, or act as a waiver by CONTRACTOR of any of the terms of the Subcontract.

7.26.2 If, as a result of SUBCONTRACTOR'S failure to comply with the provisions of this Subcontract, such use proves to be unsatisfactory to CONTRACTOR or OWNER, CONTRACTOR or OWNER shall have the right to continue such use until such portion of the Work can, without injury to CONTRACTOR or OWNER, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary, for such portion of the Work to comply with the Subcontract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve (12) months unless otherwise mutually agreed in writing between the parties.

7.26.3 SUBCONTRACTOR shall not use any permanently installed equipment unless such use is approved in writing by CONTRACTOR. When such use is approved, SUBCONTRACTOR shall at SUBCONTRACTOR'S expense, properly use and maintain and, upon completion of such use, recondition such equipment as required to meet specifications.

7.26.4 If CONTRACTOR or OWNER furnishes an operator for such equipment, all services performed shall be under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than payment of such operator's wages, Worker's Compensation Insurance, or other benefits paid directly or indirectly by CONTRACTOR or OWNER.

GC 7.27 Suspension

7.27.1 CONTRACTOR may, by written notice to SUBCONTRACTOR, suspend at any time the performance of all or any portion of the Work to be performed under the Subcontract. Upon receipt of such notice, SUBCONTRACTOR shall, unless the notice requires otherwise:

- (a) Immediately discontinue Work on the date and to the extent specified in the notice.
- (b) Place no further orders or subcontracts for material, services, or facilities with respect to suspended Work other than to the extent required in the notice.
- (c) Promptly make every reasonable effort to obtain suspension upon terms satisfactory to CONTRACTOR of all orders, subcontracts and rental agreements to the extent they relate to performance of the suspended Work.
- (d) Continue to protect and maintain the Work, including those portions on which Work has been suspended.
- (e) Take any other reasonable steps to minimize costs associated with such suspension.

7.27.2 As full compensation for such suspension, SUBCONTRACTOR will be reimbursed for the following costs, excluding profit, reasonably incurred, without duplication of any item, to the extent that such costs directly result from such Work suspension:

- (a) A standby charge to be paid to SUBCONTRACTOR during the period of Work suspension, which standby charge shall be sufficient to compensate SUBCONTRACTOR for keeping, to the extent required in the suspension notice, its organization and equipment committed to the Work on a standby basis.
- (b) All reasonable costs associated with mobilization and demobilization of SUBCONTRACTOR'S plant, forces and equipment.
- (c) An equitable amount to reimburse SUBCONTRACTOR for the cost of maintaining and protecting that portion of the Work upon which performance has been suspended.

7.27.3 Upon receipt of notice to resume suspended Work, SUBCONTRACTOR shall immediately resume performance under this Subcontract to the extent required in the notice.

7.27.4 If the SUBCONTRACTOR intends to assert a claim for equitable adjustment under this clause, it must, within ten (10) calendar days after receipt of notice to resume Work, submit to CONTRACTOR a written statement setting forth the schedule impact and monetary extent of such claim in sufficient detail to permit thorough analysis. No adjustment shall be made for any suspension to the extent that performance would have been suspended, delayed, or interrupted by an SUBCONTRACTOR non-compliance with the requirements of this Subcontract.

GC 7.28 Commercial Activities

Neither SUBCONTRACTOR nor its employees shall establish any commercial activity or issue concessions or permits of any kind to third parties for establishing commercial activities on the Jobsite or any other lands owned or controlled by CONTRACTOR or OWNER.

GC 7.29 Publicity and Advertising

SUBCONTRACTOR shall not make any announcement, take any photographs, or release any information concerning this Subcontract, the Project, or any part thereof to any member of the public, press, business entity, or any official body unless prior written consent is obtained from CONTRACTOR

GC 7.30 Quality Assurance Program

7.30.1 Within thirty (30) calendar days of Subcontract award and in any event prior to commencing Work at any Work Site, SUBCONTRACTOR shall submit a Quality Assurance Program for approval consisting of the following documents:

- (a) Quality Assurance Program Manual.
- (b) Project Quality Assurance Plan.

7.30.2 The Project-specific Quality Assurance Plan (Plan) shall address all activities relevant to the Work and shall demonstrate how all work performed by SUBCONTRACTOR will conform to the Subcontract requirements. The plan shall be submitted in accordance with Exhibit I and shall contain all elements set forth in the Scope of Work.

7.30.3 The Plan shall define the documented quality system to be applied by SUBCONTRACTOR throughout the Work, in accordance with the requirements of Department of Energy (DOE) Order 414.1C.

7.30.4 The Plan shall address the interfaces between CONTRACTOR, SUBCONTRACTOR, and other relevant organizational entities. The plan shall include an organization chart showing SUBCONTRACTOR'S corporate and Project organization responsible for managing, performing and verifying the Work. The organization chart shall be supported with a reporting and functional description of SUBCONTRACTOR'S Project organization and identification of the quality-related responsibilities of key positions.

7.30.5 The Plan shall be updated as necessary throughout the Subcontract, to reflect any changes to SUBCONTRACTOR'S documented quality system. Revisions to the manual and/or Plan must be submitted to the CONTRACTOR for approval prior to implementation.

7.30.6 SUBCONTRACTOR'S documented quality system shall provide for the issuance of a "stop work" order by the SUBCONTRACTOR or CONTRACTOR at any time during the Work when significant adverse quality trends and/or deviations from the approved Quality Assurance Program are found. CONTRACTOR reserves the right to perform Quality Assurance Audits of SUBCONTRACTOR'S approved Quality Assurance Program, including lower-tier suppliers and subcontractors, at any state of the Work.

GC 7.31 SUBCONTRACTOR Employee Concerns Program

7.31.1 The SUBCONTRACTOR'S Employee Concerns Program shall conform to DOE Order 442.1 Employee Concerns Program. The CONTRACTOR reserves the right to audit the SUBCONTRACTOR'S Employee Concerns Program for compliance and implementation at any time. As directed by CONTRACTOR, the SUBCONTRACTOR shall report and correct any deficiencies as deemed necessary.

7.31.2 As a minimum, SUBCONTRACTOR shall establish an Employee Concerns Program (ECP) that ensures employee concerns related to such issues as the environment, safety, health, and management of SUBCONTRACTOR'S programs and facilities are addressed through:

- (a) prompt identification, reporting and resolution of employee concerns regarding site facilities or operations in a manner that provides the highest degree of safe operations;
- (b) free and open expression of employee concerns that results in an independent, objective evaluation;
- (c) supplementation of existing processes with an independent avenue for reporting concerns;
- (d) employees are encouraged to first seek resolution with the first line supervisors or through existing complaint or dispute resolution systems, but that they have the right to report concerns through the DOE ECP; and
- (e) management's intolerance for reprisals against or intimidation of employees who reported concerns.

As an alternative, SUBCONTRACTOR may use CONTRACTOR'S Employee Concern Program. If this is SUBCONTRACTOR'S choice, SUBCONTRACTOR will so indicate here.

7.31.3 In support of the effective implementation of the Employee Concerns Program, SUBCONTRACTOR is required to:

- (a) assist OWNER and CONTRACTOR in the resolution of employee concerns in a manner that protects the health and safety of both employees and the public and ensures effective and efficient operation of CONTRACTOR-related activities under their jurisdiction;
- (b) ensure that SUBCONTRACTOR and lower-tier Subcontractor employees, vendors/visitors are advised that they have the right and responsibility to report concerns relating to the environment, safety, health, or management of CONTRACTOR-related activities; and
- (c) cooperate with assessments used to verify that they have acted to minimize, correct, or prevent recurrence of the situation that precipitated a valid concern.

7.31.4 The SUBCONTRACTOR is responsible for compliance with the requirements made applicable to this Subcontract regardless if the Work is completed by the SUBCONTRACTOR or its subcontractors at any tier. The SUBCONTRACTOR is responsible for flowing down the necessary provisions in this Subcontract to its subcontractors at any tier.

GC 7.32 Workers Compensation Requirements

Subcontractors will be required to provide workers' compensation in accordance with the statutes of the State of Washington (Title 51, Revised Code of Washington) for performance of work under this Subcontract including work performed by lower-tier subcontractors. SUBCONTRACTOR shall be responsible for making all payments and submitting all reports required by Title 51, Section 51.32.073, and Revised Code of Washington.

GC 7.33 Insurance

Unless otherwise specified in this Subcontract, SUBCONTRACTOR shall, at its sole expense, maintain in effect at all times during the performance of the Work insurance coverage with limits not less than those set forth below with

insurers and under forms of policies satisfactory to CONTRACTOR. SUBCONTRACTOR shall deliver to CONTRACTOR no later than ten (10) calendar days after Subcontract award, but in any event before commencing the Work or entering the Jobsite, certificates of insurance as evidence that policies providing such coverage and limits of insurance are in full force and effect. Certificates shall be issued in the form provided by CONTRACTOR or if none is provided in a form acceptable to CONTRACTOR and provide that not less than thirty (30) calendar days advance written notice will be given to CONTRACTOR prior to cancellation or termination of said policies of insurance. SUBCONTRACTOR agrees to notify CONTRACTOR not less than thirty (30) days prior to any material reduction in coverage. Certificates shall identify on their face the PROJECT NAME and the applicable SUBCONTRACT NUMBER.

7.33.1 Standard Coverage:

- A. If there is an exposure or injury to CONTRACTOR'S employees under the U.S. Longshoremen's and Harbor Worker's Compensation Act, the Jones Act or under laws, regulations, or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.
- B. SUBCONTRACTOR must have Employer's Liability of not less than \$1,000,000 each accident.
- C. General Liability Insurance:

1. Coverage

SUBCONTRACTOR shall carry Commercial General Liability Insurance covering all ongoing and completed operations by or on behalf of SUBCONTRACTOR providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and including coverage for:

- a. Premises and Operations;
- b. Products and Completed Operations
- c. Broad form or Blanket Contractual Liability;
- d. Broad form Property Damage (including Completed Operations);
- e. Explosion, Collapse and Underground Hazards; and
- f. Personal Injury Liability.

The Commercial General Liability insurance shall be written on an Occurrence Coverage Form.

2. Policy Limits

For SUBCONTRACTOR'S Commercial General Liability Insurance, the limits of liability for bodily injury, property damage, and personal injury shall be not less than:

\$2,000,000	Combined single limit for Bodily Injury and Property Damage each occurrence;
\$2,000,000	Personal Injury Limit each occurrence;
\$4,000,000	Products-Completed Operations Annual Aggregate Limit; and
\$4,000,000	General Annual Aggregate Limit (other than Products-Completed Operations).

If the policy does not have an endorsement providing the General Annual Aggregate limits on a per project basis, SUBCONTRACTOR shall provide an endorsement entitled "Amendment of Limits of Insurance (Designated Project or Premises)." Such endorsement shall provide for a Products-Completed Operations Annual Aggregate Limit of not less than \$5,000,000 and a General Annual Aggregate Limit of not less than \$5,000,000. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

3. Additional Insureds.

a. CONTRACTOR and OWNER and their subsidiaries and affiliates, and the officers, directors and employees of the foregoing shall be named as Additional Insureds under the Commercial General Liability Insurance policy, but only with respect to liability arising out of the operations for CONTRACTOR and OWNER by or for SUBCONTRACTOR. In the United States, Insurance Services Office (ISO) form CG 20 10 and CG 20 37 shall be attached to the policy. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insureds, be primary as regards any other coverage maintained for or by the Additional Insureds, and shall contain a cross-liability or severability of interest clause.

b. In lieu of naming CONTRACTOR and OWNER as Additional Insureds under the Commercial General Liability policy, SUBCONTRACTOR may, at CONTRACTOR'S sole discretion and not as an option, provide Owners and Contractors Protective Liability Insurance. If SUBCONTRACTOR purchases Owners and Contractors Protective Liability Insurance for the benefit of OWNER and CONTRACTOR, the policy shall have a combined single limit for Bodily Injury or Property Damage of not less than:

\$2,000,000 Each Occurrence, and
\$2,000,000 Annual Aggregate.

c. The Subcontract (the Work) shall be designated in the Policy Declarations and the policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Named Insured.

D. 1. Automobile Liability Insurance, including coverage for the operation of any vehicle, shall include, but be not limited to, owned, hired and non-owned vehicles: The combined single limit for Bodily Injury and Property Damage Liability shall be not less than \$2,000,000 for any one accident or loss. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

2. SUBCONTRACTOR'S Automobile Liability Insurance shall include coverage for Automobile Contract Liability.

3. The policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Additional Insured. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insured, be primary as regards any other coverage maintained for or by the "Additional Insured's, and shall contain a cross-liability or severability of interest clause.

E. In the event SUBCONTRACTOR maintains insurance covering loss or damage to equipment, tools, or any other property of SUBCONTRACTOR, such insurance shall include an Insurer's waiver of subrogation in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates.

7.33.2 Special Operations Coverage. Should any of the Work:

A. 1. Involve marine operations, SUBCONTRACTOR shall provide or have provided coverage for liabilities arising out of such marine operations, including contractual liability under its commercial General Liability Insurance or Marine Hull and Machinery Insurance, and Protection, and indemnity insurance, each with a minimum Limit of Liability of \$5,000,000. In the event such marine operations involve any SUBCONTRACTOR owned, hired, chartered, or operated vessels, barges, tugs or other marine equipment, SUBCONTRACTOR agrees to provide or have provided Marine Hull and Machinery Insurance and Protection and indemnity insurance and/or Charterer's Liability Insurance.

The combined limit of the Protection and Indemnity Insurance and/or Charterer's Liability Insurance shall be no less than the market value of the vessel or \$5,000,000, whichever is greater. The Protection and Indemnity and/or Charterer's liability and Hull and Machinery coverage shall include coverage for contractual liability, wreck removal, tower's liability, if applicable, and full collision coverage, and shall be endorsed:

- a. To provide full coverage to CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured without limiting coverage to liability "as owner of the vessel" and to delete any "as owner" clause or other language that would limit coverage to liability of an insured "as owner of the vessel;" and
- b. To waive limit to full coverage for the Additional Insured provided by any applicable liability statute.

All marine insurances provided by SUBCONTRACTOR shall include an Insurer's waiver of subrogation in favor of the Additional Insured.

2. Involve the hauling of property in excess of \$300,000, SUBCONTRACTOR shall also carry "All Risk" Transit Insurance, or "All Risk" Motor Truck Cargo Insurance, or such similar form of insurance that will insure against physical loss or damage to the property being transported, moved or handled by SUBCONTRACTOR pursuant to the terms of this Subcontract.

Such insurance shall provide a limit of not less than the replacement cost of the highest value being moved, shall insure the interest of SUBCONTRACTOR, CONTRACTOR, OWNER, and the subsidiaries and affiliates of CONTRACTOR and OWNER as their respective interests may appear and shall include an insurer's waiver of subrogation rights in favor of each.

- B. Involve aircraft (fixed or rotary wing) owned, operated, or chartered by the SUBCONTRACTOR, liability arising from such aircraft shall be insured for a combined single limit not less than \$10,000,000 each occurrence, and such limit shall apply to Bodily Injury (including passengers) and Property Damage Liability. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insureds, include an Insurer's waiver of subrogation in favor of the Additional Insureds, state that it is primary insurance as regards the Additional Insureds, and contain a cross-liability or severability of interest clause. If the aircraft hull is insured, such insurance shall provide for an Insurer's waiver of subrogation rights in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates. In the event SUBCONTRACTOR charters aircraft, the foregoing insurance and evidence of insurance may be furnished by the owner of the chartered aircraft, provided the above requirements are met.
- C. Involve investigation, removal, or remedial action concerning the actual or threatened escape of hazardous substances, SUBCONTRACTOR shall also carry Pollution Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. Such insurance shall provide coverage for both sudden and gradual occurrences arising from the Work performed under this Subcontract. If Completed Operations is limited in the policy, such Completed Operation Coverage shall be for a period of not less than five (5) years. Such insurance shall include a three (3)-year extended discovery period and shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.
- D. Involve inspection, handling, or removal of asbestos, SUBCONTRACTOR shall also carry Asbestos Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. The policy shall be written on an "Occurrence Basis" with no sunset clause. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.

- E. Involve transporting hazardous substances, SUBCONTRACTOR shall also carry Business Automobile Insurance covering liability arising from transportation of hazardous materials in an amount not less than \$2,000,000 per occurrence. Such policy shall include Motor Carrier Endorsement MCS-90. NEITHER CONTRACTOR NOR OWNER IS TO BE NAMED AN ADDITIONAL INSURED FOR THIS POLICY.
- F. Involve treatment, storage, or disposal of hazardous wastes, SUBCONTRACTOR shall furnish an insurance certificate from the designated disposal facility establishing that the facility operator maintains current Environmental Liability Insurance in the amount of not less than \$5,000,000 per occurrence/annual aggregate.

7.33.3 Related Obligations

- A. The requirements contained herein as to types and limits, as well as CONTRACTOR'S approval of insurance coverage to be maintained by SUBCONTRACTOR, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by SUBCONTRACTOR under this Subcontract.
- B. The Certificates of Insurance must provide clear evidence that SUBCONTRACTOR'S Insurance Policies contain the minimum limits of coverage and the special provisions prescribed in this clause.

7.33.4 CONTRACTOR or OWNER-Furnished Insurance:

Neither CONTRACTOR nor OWNER is maintaining any insurance on behalf of SUBCONTRACTOR covering against loss or damage to the Work or to any other property of SUBCONTRACTOR unless otherwise specifically stated herein and as may be described by appendix hereto.

7.33.5 Notifications:

In accordance with the submittal requirements outlined above, SUBCONTRACTOR shall deliver the original and two (2) copies of the Certificate of Insurance required by this clause and all subsequent notices of cancellation, termination, and alteration of such policies to:

Washington Closure Hanford LLC (WCH)
2620 Fermi Avenue
Richland, WA 99354
Attention: Dana Looney _____ Mail Stop: H4-17
Subcontract No: S013213A00

8.0 THE CONTRACTOR

GC 8.1 Authorized Representatives

Before starting Work, SUBCONTRACTOR shall designate in writing an authorized representative acceptable to CONTRACTOR to represent and act for SUBCONTRACTOR and shall specify any and all limitations of such representative's authority. Such representative shall be present or be represented at the Jobsite at all times when Work is in progress, and shall be empowered to receive communications in accordance with this Subcontract on behalf of SUBCONTRACTOR. During periods when the Work is suspended, arrangements shall be made for an authorized representative acceptable to CONTRACTOR for any emergency Work that may be required. All communications given to the authorized representative by CONTRACTOR in accordance with this Subcontract shall be binding upon SUBCONTRACTOR. CONTRACTOR shall designate, in writing, one or more representatives to represent and act for CONTRACTOR and to receive communications from SUBCONTRACTOR. Notification of changes of authorized representatives for either CONTRACTOR or SUBCONTRACTOR shall be provided in advance, in writing, to the other party.

GC 8.2 Medical Examinations

- 8.2.1 CONTRACTOR shall provide all occupational medical requirements including physical examinations through the Hanford Site Occupational Medicine Provider. Subcontractors shall contact the Subcontract Technical Representative to coordinate access to site medical services. All time spent by SUBCONTRACTOR'S employees and transportation costs for medical examinations shall be at the expense of the SUBCONTRACTOR.
- 8.2.2 The SUBCONTRACTOR shall endeavor to employ only those persons who are physically qualified to perform work to which they are assigned at the jobsite with or without reasonable accommodation. If the SUBCONTRACTOR or CONTRACTOR determines that there may be a question of the person's physical fitness to safely perform work to be assigned, the SUBCONTRACTOR shall, with the approval of CONTRACTOR, require such employee to undergo a medical examination.
- 8.2.3 In any case where it is determined that a SUBCONTRACTOR employee is physically unable to perform the essential duties of the job, with or without reasonable accommodation, CONTRACTOR reserves the right to determine whether or not the employee may be assigned to work at the Jobsite and to determine any work assignment limitations to be imposed, and the SUBCONTRACTOR shall be responsible for enforcing CONTRACTOR'S decision.
- 8.2.4 The Hanford Site medical services provider at the discretion of the CONTRACTOR may review medical records.

GC 8.3 First Aid Facilities

Where CONTRACTOR or OWNER have first aid facilities at the Jobsite they may, at their option, make available their first aid facilities to treat employees of SUBCONTRACTOR who may be injured or become ill while performing the Work under this subcontract. If first aid facilities and/or services are made available to SUBCONTRACTOR'S employees, then, in consideration for the use of such facilities and the receipt of such services, SUBCONTRACTOR hereby agrees:

- (a) To release, defend, indemnify, and hold harmless CONTRACTOR, OWNER, and their authorized representatives, successors or assigns, and all of their officers and employees from and against any and all claims, demands, liabilities, including attorney's fees, arising from the receipt of such services or the use of such facilities by SUBCONTRACTOR'S employees, except for claims and demands arising out of the sole active negligence of CONTRACTOR, OWNER, or any of their representatives.
- (b) Upon receipt of any notice from CONTRACTOR or OWNER of any such claim, demand, or liability being pursued against CONTRACTOR or OWNER, to not only undertake the defense of such claim, demand or liability, but also upon entry of judgment, to make any and all payments necessary thereunder.
- (c) If any of SUBCONTRACTOR'S employees require off-site medical services, including transportation thereto, SUBCONTRACTOR shall promptly pay for such services directly to the providers thereof.

GC 8.4 Notices

Any notices provided for hereunder shall be in writing and may be served either personally on the authorized representative of the receiving party at the Jobsite or by registered mail to the address of that party, as shown on the face of the Subcontract Agreement Form or as such address may have been changed by written notice.

GC 8.5 Changes

- 8.5.1 CONTRACTOR may, at any time, without notice to the sureties, by written Change Notice, unilaterally make any change in the Work within the general scope of this Subcontract, including, but not limited to, changes:
- (a) In the drawings, designs, or specifications.

- (b) In the method, manner, or sequence of SUBCONTRACTOR Work.
- (c) In OWNER or CONTRACTOR-furnished facilities, equipment, materials, services, or site(s).
- (d) Directing acceleration or deceleration in the performance of the Work.
- (e) Modifying the Subcontract Schedule or the Subcontract Milestones.

8.5.2 All other changes to this Subcontract outside the scope of work shall be by written Modification signed by both parties

8.5.3 If an emergency occurs that endangers life or property, CONTRACTOR may use oral orders to SUBCONTRACTOR for any work required by reason of such emergency. SUBCONTRACTOR shall commence and complete such emergency work, as directed by CONTRACTOR. Such orders will be confirmed by Change Notice..

8.5.4 If at any time SUBCONTRACTOR believes that acts or omissions of CONTRACTOR or OWNER constitute a change to the Work not covered by a Change Notice, SUBCONTRACTOR shall within ten (10) calendar days of discovery of such act or omission submit a written Change Notice Request explaining, in detail, the basis for the request. CONTRACTOR will either issue a Change Notice or deny the request in writing.

8.5.5 If any change under this clause directly or indirectly causes an increase or decrease in cost of, or the time required for, the performance of any part of the Work under this Subcontract, whether or not changed by any order, an equitable adjustment shall be made and the Subcontract modified accordingly. However, SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors for increased costs in connection with any changes or delays in the Work for claims arising in tort (including negligence), or in contract except as specifically provided in this Subcontract.

8.5.6 If the SUBCONTRACTOR intends to assert a claim for an equitable adjustment under this clause, it must, within (10) calendar days after receipt of a Change Notice provide written notification of such intent and within a further twenty (20) calendar days, pursuant to the Special Condition clause titled "PRICING ADJUSTMENTS," submit to CONTRACTOR a written proposal in sufficient detail to permit thorough analysis and negotiation.

8.5.7 To facilitate prompt resolution, Requests for Equitable Adjustments, require a full and complete submittal of factual causes, contractual bases, quantified impacts, documentary evidence, and proposed resolutions from the Subcontractor. Submittals should address the following:

- (a) A description of the work performed, delayed, or impacted.
- (b) Quantified cost and schedule impacts.
- (c) A description of the contractual bases for entitlement.
- (d) A description of the requested relief.

8.5.8 Any delay by SUBCONTRACTOR in giving notice or presenting a proposal for adjustment under this clause shall be grounds for rejection of the claim if and to the extent CONTRACTOR or OWNER are prejudiced by such delay. In no case shall a claim by SUBCONTRACTOR be considered if asserted after final payment under this Subcontract.

8.5.9 Failure by CONTRACTOR and SUBCONTRACTOR to agree on any adjustment shall be a dispute within the meaning of the General Condition clause titled "DISPUTES." However, SUBCONTRACTOR shall proceed diligently with performance of the work, as changed, pending final resolution of any request for relief, dispute, claim appeal, or action arising under the Subcontract and comply with any decision of CONTRACTOR.

GC 8.6 Final Inspection and Acceptance

8.6.1 When SUBCONTRACTOR considers the Work, or any CONTRACTOR-identified independent portion of the Work, under this Subcontract to be complete and ready for acceptance, SUBCONTRACTOR shall notify CONTRACTOR in writing. CONTRACTOR, with SUBCONTRACTOR'S cooperation, will

conduct such reviews, inspections, and tests as may be reasonably required to satisfy CONTRACTOR that the Work, or identified portion of the Work, conforms to all requirements of the Subcontract. If all or any part of the Work covered by SUBCONTRACTOR'S notice does not conform to Subcontract requirements, CONTRACTOR shall notify SUBCONTRACTOR of such nonconformance and SUBCONTRACTOR shall take corrective action and then have the nonconforming work re-inspected until all Subcontract requirements are satisfied.

8.6.2 CONTRACTOR shall issue a Notice of Provisional Acceptance for individual portions that have been satisfactorily inspected, subject only to CONTRACTOR'S Final Acceptance of the Work as a whole.

8.6.3 CONTRACTOR'S written Notice of Final Acceptance of the Work under this Subcontract shall be final and conclusive, except with regard to latent defects, fraud, or such gross mistakes as amount to fraud, or with regard to CONTRACTOR'S and OWNER'S rights under the General Condition clause titled "WARRANTY."

GC 8.7 Emergency Situation

The OWNER or designee shall have sole discretion to determine when an emergency situation exists at the Hanford Site, except for the DOE Office of River Protection Project facilities, affecting site personnel, the public health, safety, the environment, or security. The Manager, Office of River Protection (ORP), or designee has the discretion to determine whether an emergency situation exists under other ORP contract areas of work that might affect RL workers. In the event that either the RL or ORP Manager or designee determines such an emergency exists, the RL Manager or designee will have the authority to direct any and all activities of the Subcontractor and lower tier subcontractors necessary to resolve the emergency situation. The RL Manager or designee may direct the activities of the Subcontractor and lower subcontractors throughout the duration of the emergency. The Subcontractor shall include this clause in all lower-tier subcontracts for work performed at the Hanford Site.

9.0 GENERAL SUBCONTRACT PROVISIONS

GC 9.1 Applicable Law

Irrespective of the place of performance, the provisions in this Order that adopt or adapt Federal Government Acquisition Regulations (FAR) shall be construed and interpreted according to the federal common law of government contracts as enunciated and applied by federal judicial bodies, boards of contracts appeals, and quasi-judicial agencies of the federal government. To the extent that the federal common law of government contracts is not dispositive, the laws of the State of Washington shall apply.

GC 9.2 Words and Phrases

9.2.1 Where the words "as shown," or words of like import are used in this Subcontract, reference is to the drawings listed in this Subcontract unless the context clearly indicates a different meaning. Where the words "required," "approved," "satisfactory," "determined," "acceptable" or words of like import are used in this Subcontract, action by CONTRACTOR is indicated unless the context clearly indicates otherwise, and all the Work shall be in accordance therewith.

9.2.2 A requirement that a SUBCONTRACTOR-furnished document is to be submitted for or subject to "Authorization to Proceed," "Approval," "Acceptance," "Review," "Comment," or any combinations of such words or words of like import shall mean unless the context clearly indicates otherwise, that SUBCONTRACTOR shall, before implementing the information in the document, submit the document, obtain resolution of any comments and authorization to proceed. Such review shall not mean that a complete check will be performed. Authorization to proceed shall not constitute acceptance or approval of design details, calculations, analyses, tests, construction methods, or materials developed or selected by SUBCONTRACTOR and shall not relieve SUBCONTRACTOR from full compliance with requirements of the Subcontract.

9.2.3 Such action, or failure to act, shall not relieve SUBCONTRACTOR of its contractual responsibilities for performance of this Subcontract. Wherever in this Subcontract it is provided that SUBCONTRACTOR

shall perform certain Work "at its expense" or "without charge" or that certain Work "will not be paid for separately," such quoted words mean that SUBCONTRACTOR shall not be entitled to any additional compensation from CONTRACTOR for such Work, and the cost thereof shall, unless otherwise specified, be considered as included in the payment for other items of the Work.

GC 9.3 Taxes

- 9.3.1 SUBCONTRACTOR shall pay all taxes, levies, duties, and assessments of every nature in connection with the Work under this Subcontract and shall make any and all payroll deductions required by law, and hereby indemnifies and holds harmless CONTRACTOR and OWNER from any liability on account of any and all such taxes, levies, duties, assessments, and deductions.
- 9.3.2 CONTRACTOR recognizes that the tax classification established by Revised Code of Washington (RCW) 82.04.263 (currently taxed at the rate of 0.471 percent) may be applicable to the performance of all work under this Subcontract.
- 9.3.3 Subcontractor will include the above language related to Washington State B&O Tax in all sub-tier subcontracts and purchase orders.

GC 9.4 Backcharges

- 9.4.1 If, under the provisions of this Subcontract, SUBCONTRACTOR is notified by CONTRACTOR to correct defective or nonconforming Work, and SUBCONTRACTOR states or by its actions indicates that it is unable or unwilling to proceed with corrective action in a reasonable time, CONTRACTOR may, upon written notice, proceed to accomplish the redesign, repair, rework, or replacement of nonconforming Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred. Furthermore, if CONTRACTOR agrees to or is required to perform Work for SUBCONTRACTOR, such as cleanup, off-loading, or completion of incomplete Work, CONTRACTOR may, upon written notice, perform such Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred.
- 9.4.2 The cost of backcharge Work shall include:
 - (a) Incurred labor costs, including all payroll additives.
 - (b) Incurred net delivered material costs.
 - (c) Incurred lower-tier supplier and subcontractor costs directly related to performing the corrective action.
 - (d) Equipment and tool rentals at prevailing rates in the Jobsite area.
 - (e) A factor of sixty percent (60%) applied to the total of items (a) through (d) for CONTRACTOR'S overhead, supervision, and administrative costs.
- 9.4.3 The backcharge notice will request SUBCONTRACTOR'S approval for CONTRACTOR to proceed with the required Work. However, failure of SUBCONTRACTOR to grant such approval shall not impair CONTRACTOR'S right to proceed with Work under this or any other provision of this Subcontract.
- 9.4.4 CONTRACTOR shall separately invoice or deduct from payments otherwise due to SUBCONTRACTOR the costs, as provided herein. CONTRACTOR'S right to backcharge is in addition to any and all other rights and remedies provided in this Subcontract or by law. The performance of backcharge Work by CONTRACTOR shall not relieve SUBCONTRACTOR of any of its responsibilities under this Subcontract, including, but not limited to, express or implied warranties, specified standards for quality, contractual liabilities and indemnifications, and the Subcontract Schedule.

GC 9.5 Examination of SUBCONTRACTOR's Record's and Accounts

SUBCONTRACTOR shall maintain a separate and distinct set of accounts and records in accordance with the General Condition entitled "DEAR 970.5232-3, Accounts, Records and Inspections (DEC 2000)." Inspection, copying, auditing and retention of such records shall be in accordance with the above General Condition and the General Condition entitled "DEAR 970.5204-3, Access To and Ownership of Records (DEC 2000)."

GC 9.6 Title to Materials Found

The title to water, soil, rock, gravel, sand, minerals, timber, and any other materials developed or obtained in the excavation or other operations of SUBCONTRACTOR or any of its lower-tier subcontractors and the right to use said materials or dispose of same is hereby expressly reserved by OWNER. Neither SUBCONTRACTOR, its lower-tier subcontractors, nor any of their representatives or employees shall have any right, title, or interest in said materials, nor shall they assert or make any claim thereto. SUBCONTRACTOR may, at the sole discretion of OWNER, be permitted, without charge, to use in the Work any such materials that meet the requirements of this Subcontract.

GC 9.7 Termination for Default

9.7.1 Notwithstanding any other provisions of this Subcontract, SUBCONTRACTOR shall be considered in default of its contractual obligations under this Subcontract if SUBCONTRACTOR:

- (a) Performs work that fails to conform to the requirements of this Subcontract.
- (b) Fails to make progress so as to endanger performance of this Subcontract.
- (c) Abandons or refuses to proceed with any of the Work, including modifications directed pursuant to the General Condition clause titled "CHANGES."
- (d) Fails to fulfill or comply with any of the terms of this Subcontract.
- (e) Engages in behavior that is dishonest, fraudulent, or constitutes a conflict of interest with SUBCONTRACTOR'S obligations under this Subcontract.
- (f) Becomes insolvent or makes a general assignment for the benefit of creditors or reasonable grounds for insecurity arise with respect to SUBCONTRACTOR'S performance.
- (g) Fails to correct an unsafe condition or noncompliance or demonstrates a persistent pattern of poor safety performance.

9.7.2 Upon the occurrence of any of the foregoing, CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the nature of the failure and of CONTRACTOR'S intention to terminate the Subcontract for default. If SUBCONTRACTOR does not cure such failure within seven (7) calendar days from receipt of notification, or sooner if safety to persons is involved, or fails to provide satisfactory evidence that such default will be corrected within a reasonable time, CONTRACTOR may, by written notice to SUBCONTRACTOR and without notice to SUBCONTRACTOR'S sureties, if any, terminate in whole or in part SUBCONTRACTOR'S right to proceed with the Work and CONTRACTOR may prosecute the Work to completion by contract or by any other method deemed expedient. CONTRACTOR may take possession of and utilize any data, designs, licenses, equipment, materials, plant, tools, and property of any kind furnished by SUBCONTRACTOR and necessary to complete the Work.

9.7.3 SUBCONTRACTOR and its sureties, if any, shall be liable for all costs in excess of the Subcontract price for such terminated work reasonably and necessarily incurred in the completion of the Work as scheduled, including cost of administration of any purchase order or subcontract awarded to others for completion.

9.7.4 Upon termination for default, SUBCONTRACTOR shall:

- (a) Immediately discontinue work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts to the extent that they relate to the performance of the terminated work.
- (b) Inventory, maintain, and turn over to the CONTRACTOR all data, designs, licenses, equipment, materials, plant, tools, and property furnished by SUBCONTRACTOR or provided by CONTRACTOR for performance of the terminated work.
- (c) Promptly obtain cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for performance of the terminated work or assign those agreements as directed by CONTRACTOR.
- (d) Cooperate with the CONTRACTOR in transfer of data, designs, licenses, and information and disposition of work in progress so as to mitigate damages.
- (e) Comply with other reasonable requests from CONTRACTOR regarding the terminated work.
- (f) Continue to perform in accordance with all of the terms and conditions of this Subcontract of such portion of the Work that is not terminated.

9.7.5 If, after termination pursuant to this clause, it is determined for any reason that SUBCONTRACTOR was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to the General Condition clause titled "TERMINATION FOR CONVENIENCE."

GC 9.8 Termination for Convenience

9.8.1 CONTRACTOR may, at its option, terminate for convenience any of the Work under this Subcontract in whole or, from time to time, in part, at any time by written notice to SUBCONTRACTOR. Such notice shall specify the extent to which the performance of the Work is terminated and the effective date of such termination. Upon receipt of such notice SUBCONTRACTOR shall:

- (a) Immediately discontinue the Work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts for materials, services, or facilities, other than as may be required for completion of such portion of the Work that is not terminated.
- (b) Promptly obtain assignment or cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for the performance of the terminated work or assign those agreements directed by CONTRACTOR.
- (c) Assist CONTRACTOR in the maintenance, protection, and disposition of work in progress, plant, tools, equipment, property, and materials acquired by SUBCONTRACTOR or furnished by CONTRACTOR under this Subcontract.
- (d) Complete performance of such portion of the Work that is not terminated.

9.8.2 Upon any such termination, SUBCONTRACTOR shall waive any claims for damages, including loss of anticipated profits; on account thereof, but as the sole right and remedy of SUBCONTRACTOR, CONTRACTOR shall pay in accordance with the following:

- (a) The subcontract price corresponding to the work performed in accordance with this Subcontract before such notice of termination.
- (b) All reasonable costs for work thereafter performed, as specified in such notice.
- (c) Reasonable administrative costs of settling and paying claims arising from terminating work under purchase orders or subcontracts.

(d) Reasonable costs incurred in demobilization and the disposition of residual material, plant, and equipment.

(e) A reasonable overhead and profit on items (a) through (d) of this clause.

9.8.3 SUBCONTRACTOR shall submit within thirty (30) calendar days after receipt of notice of termination, a written statement setting forth its proposal for an adjustment to the subcontract price to include only the incurred costs described in this clause. CONTRACTOR shall review, analyze, and verify such proposal, and negotiate an equitable adjustment, and the Subcontract shall be modified accordingly.

GC 9.9 Non-Waiver

Failure by CONTRACTOR to insist upon strict performance of any terms or conditions of this Subcontract, or failure or delay to exercise any rights or remedies provided herein or by law, or failure to properly notify SUBCONTRACTOR in the event of breach, or the acceptance of or payment for any goods or services hereunder, or the review or failure to review designs shall not release SUBCONTRACTOR from any of the warranties or obligations of this Subcontract and shall not be deemed a waiver of any right of CONTRACTOR or OWNER to insist upon strict performance hereof or any of its rights or remedies as to any prior or subsequent default hereunder, nor shall any termination of Work under this Subcontract by CONTRACTOR operate as a waiver of any of the terms hereof.

GC 9.10 Indemnity, Fines and Penalties

9.10.1 SUBCONTRACTOR hereby releases and shall indemnify, defend, and hold harmless CONTRACTOR, OWNER, and their subsidiaries and affiliates and the officers, agents, employees, successors and assigns and authorized representatives of all the foregoing from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs and expenses of whatsoever kind or nature, in connection with or incidental to the performance of this subcontract, whether arising before or after completion of the Work hereunder and in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part, or claimed to be caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of SUBCONTRACTOR, its lower-tier suppliers, subcontractors or of anyone acting under its direction or control or on its behalf in connection with or incidental to the performance of this Subcontract. SUBCONTRACTOR'S aforesaid release, indemnity, and hold harmless obligations, or portions or applications thereof, shall apply to the extent of its negligence or fault and to the fullest extent permitted by law.

9.10.2 The foregoing shall include, but is not limited to, indemnity for:

(a) Property damage and injury to or death of any person, including employees of CONTRACTOR, OWNER or SUBCONTRACTOR.

(b) The breach by SUBCONTRACTOR of any representation, warranty, covenant, or performance obligation of this subcontract.

(c) Events which are directly or indirectly caused by or incident to the radioactive, toxic and/or hazardous properties of any substances.

(d) Events which arise out of any state or federal statute relating to radioactive, toxic and/or hazardous properties, such as the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) or Resource Conservation and Recovery Act of 1976 (RCRA), and shall apply to any clean-up or response costs occasioned by the transport, treatment, storage or disposal by SUBCONTRACTOR or any third party of radioactive, toxic and/or hazardous properties.

9.10.3 SUBCONTRACTOR specifically waives any immunity provided against this indemnity by an industrial insurance or workers' compensation statute.

9.10.4 SUBCONTRACTOR is liable to CONTRACTOR for fines and penalties assessed by any governmental entity against CONTRACTOR or OWNER as a result of SUBCONTRACTOR'S performance or lack of performance. SUBCONTRACTOR shall indemnify and hold harmless CONTRACTOR and OWNER from and against any and all claims, demands, actions, causes of action, suits, damages, expenses, including attorney's fees, and liabilities whatsoever resulting from or arising in any manner on account of the assessment of said fines and penalties against CONTRACTOR or OWNER.

GC 9.11 Patent and Intellectual Property Indemnity

9.11.1 In addition to FAR 52.227-4, Patent Indemnity-Construction Contracts (APR 1984), SUBCONTRACTOR hereby indemnifies and shall defend and hold harmless CONTRACTOR, OWNER, and their representatives from and against any and all claims, actions, losses, damages, and expenses, including attorney's fees, arising from any claim, whether rightful or otherwise, that any concept, product, design, equipment, material, process, copyrighted material or confidential information, or any part thereof, furnished by SUBCONTRACTOR under this Subcontract constitutes an infringement of any patent or copyrighted material or a theft of trade secrets. If use of any part of such concept, product, design, equipment, material, process, copyrighted material or confidential information is limited or prohibited, SUBCONTRACTOR shall, at its sole expense, procure the necessary licenses to use the infringing or a modified by non-infringing concept, product, design, equipment, material, process, copyrighted material or confidential information or, with CONTRACTOR'S OR OWNER'S prior written approval, replace it with substantially equal but non-infringing concepts, products, designs, equipment, materials, processes, copyrighted material or confidential information; provided, however,

(a) That any such substituted or modified concepts, products, designs, equipment, material, processes, copyrighted material, or confidential information shall meet all the requirements and be subject to all the provisions of this Subcontract.

(b) That such replacement or modification shall not modify or relieve SUBCONTRACTOR of its obligations under this Subcontract.

9.11.2 The foregoing obligation shall not apply to any concept, product, design, equipment, material, process, copyrighted material, or confidential information the detailed design of which (excluding rating and/or performance specifications) has been furnished in writing by CONTRACTOR or OWNER to SUBCONTRACTOR.

GC 9.12 Assignments and Subcontracts

9.12.1 Any assignment of this Subcontract or rights hereunder, in whole or part, without the prior written consent of CONTRACTOR shall be void, except that upon ten (10) calendar days written notice to CONTRACTOR, SUBCONTRACTOR may assign monies due or to become due under this Subcontract, provided that any assignment of monies shall be subject to proper set-offs in favor of CONTRACTOR and any deductions provided for in this Subcontract.

9.12.2 SUBCONTRACTOR shall not subcontract with any third party for the performance of all or any portion of the Work without the advance written approval of CONTRACTOR. Lower-tier subcontracts and purchase orders must include provisions to secure all rights and remedies of CONTRACTOR and OWNER provided under this Subcontract, and must impose upon the lower-tier supplier and subcontractor all of the general duties and obligations required to fulfill this Subcontract.

9.12.3 Copies of all purchase and subcontract agreements are to be provided to CONTRACTOR upon request. Pricing may be deleted unless the compensation to be paid thereunder is reimbursable under this Subcontract.

9.12.4 No assignment or subcontract will be approved that would relieve SUBCONTRACTOR or its sureties, if any, of their responsibilities under this Subcontract.

GC 9.13 Survival

The rights and obligations of the parties that by their nature survive termination or completion of this Subcontract, including, but not limited to, those set forth in the General Conditions titled "WARRANTY" and "INDEMNITY," shall remain in full force and effect.

GC 9.14 Disputes

- 9.14.1 SUBCONTRACTOR shall proceed diligently with performance of the Work, pending final resolution of any request for relief, dispute, claim, appeal, or action arising under the Subcontract, and comply with any decision of CONTRACTOR. SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors in tort (including negligence), or contract except as specifically provided in this Subcontract.
- 9.14.2 Any claim for an adjustment to the Subcontract price or time of performance which cannot be resolved by negotiation shall be considered a dispute within the meaning of this clause.
- 9.14.3 If for any reason SUBCONTRACTOR and CONTRACTOR are unable to resolve a claim for an adjustment, SUBCONTRACTOR or CONTRACTOR shall notify the other party in writing that a dispute exists and request or provide a final determination by CONTRACTOR. Any such request by SUBCONTRACTOR shall be clearly identified by reference to this clause and shall summarize the facts in dispute and SUBCONTRACTOR'S proposal for resolution.
- 9.14.4 If CONTRACTOR'S final determination is not accepted by SUBCONTRACTOR the matter shall, within thirty (30) calendar days, be referred to senior executives of the parties who shall have designated authority to settle the dispute. The parties shall promptly prepare and exchange memoranda stating the issues in dispute and their respective positions, summarizing the negotiations that have taken place and attaching relevant documents.
- 9.14.5 The senior executives will meet for negotiations at a mutually agreed time and place. If the matter has not been resolved within thirty (30) calendar days of the commencement of such negotiations, the parties agree to consider resolution of the dispute through some form of Alternative Dispute Resolution (ADR) process that is mutually acceptable to the parties.
- 9.14.6 Should the parties agree to pursue an ADR process, each party will be responsible for its own expenses incurred to resolve the dispute during the ADR process.
- 9.14.7 If the parties do not agree to an ADR process or are unable to resolve the dispute through ADR, either party shall then have the right to pursue any legal remedy.

GC 9.15 Nondisclosure

- 9.15.1 SUBCONTRACTOR agrees not to divulge to third parties, without the written consent of CONTRACTOR or OWNER, any information obtained from or through CONTRACTOR or OWNER in connection with the performance of this Subcontract unless:
 - (a) The information is known to SUBCONTRACTOR before obtaining the same from CONTRACTOR or OWNER;
 - (b) The information is, at the time of disclosure by SUBCONTRACTOR, then in the public domain; or
 - (c) The information is obtained by SUBCONTRACTOR from a third party who did not receive same, directly or indirectly, from CONTRACTOR or OWNER and who has no obligation of secrecy with respect thereto.
- 9.15.2 SUBCONTRACTOR further agrees that it will not, without the prior written consent of CONTRACTOR or OWNER, disclose to any third party any information developed or obtained by SUBCONTRACTOR

in the performance of this Subcontract except to the extent that such information falls within one of the categories described in (a), (b), or (c) above.

- 9.15.3 If so requested by CONTRACTOR or OWNER, SUBCONTRACTOR further agrees to require its employees to execute a nondisclosure agreement before performing any Work under this Subcontract.

GC 9.16 Procurement Integrity

- 9.16.1 The SUBCONTRACTOR warrants that it is familiar with and will comply with all the requirements of Section 27 of the Office of Federal Procurement Policy Act of 1988 (41 U.S.C. §423), as implemented in the Federal Acquisition Regulations (referred to in this clause as "the Act"), including, but not limited to (1) prohibitions on giving or offering future employment, money, or anything of value to a procurement official, (2) prohibitions on soliciting or obtaining from an agency, prior to award, any proprietary or source selection information regarding the procurement, and (3) limits on participation of former government employees and officials in negotiation and performance of government contracts. For a violation of the Act, the Government may reduce the fee or profit on the contract, terminate all or a portion of the contract for default, suspend or debar the contractor from future Federal Government work, impose fines or imprisonment, or pursue other legal remedies.
- 9.16.2 In addition to any other remedies provided by law or herein, the SUBCONTRACTOR agrees to indemnify and hold CONTRACTOR harmless to the full extent of any loss (including any reduction in fee or profit), damages, or expenses (including attorney's fees) if any of the SUBCONTRACTOR'S actions, acting alone or in concert with any other person or entity, cause the government to enforce the provisions of the Act or related regulations against CONTRACTOR.
- 9.16.3 The SUBCONTRACTOR agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all lower-tier subcontracts in amounts exceeding \$100,000.00.

GC 9.17 Rights in Data

When design and/or data is furnished under this Subcontract, FAR 52.227-14 applies.

GC 9.18 Continuity of Service

- 9.18.1 The SUBCONTRACTOR recognizes that the services performed under this Subcontract are vital to the OWNER and must be continued without interruption, and that, upon expiration of the Prime Contract between the OWNER and the CONTRACTOR, a successor, either the Government or another Contractor, may continue to require that the services be performed. The CONTRACTOR shall provide a sixty (60) day written notice to the SUBCONTRACTOR once the successor has been named. The SUBCONTRACTOR shall work with the OWNER and the CONTRACTOR to ensure an efficient transfer to the successor is made.
- 9.18.2 CONTRACTOR may assign this Subcontract to the OWNER or to such party as OWNER may designate to perform CONTRACTOR'S obligations hereunder. Upon receipt by SUBCONTRACTOR of written notice that the OWNER or a party so designated by the OWNER has accepted an assignment of this Subcontract, CONTRACTOR shall be relieved of all responsibility hereunder and SUBCONTRACTOR shall thereafter look solely to such assignee for performance of CONTRACTOR'S obligations.

GC 9.19 Government Flowdowns

The Federal Acquisition Regulation (FAR), the Department of Energy (DOE) FAR Supplement (DEAR) clauses, and the DOE Procurement Regulations incorporated herein shall have the same force and effect as if printed in full text. Upon request, CONTRACTOR will make their full text available. Wherever necessary to make the context of the FAR and DEAR clauses applicable to this Subcontract, the term "Contractor" shall mean "SUBCONTRACTOR," the term "Contract" shall mean this Subcontract, and the term "Government," Contracting Officer" and equivalent phrases shall mean the CONTRACTOR'S representative, except the terms "Government" and Contracting Officer"

do not change: (1) in the phrases "Government Property," "Government-Furnished Property," and "Government-Owned Property"; (2) in the patent clauses incorporated herein; (3) when a right, act, authorization or obligation can be granted or performed only by the Government's duly authorized representative; (4) when title to property is to be transferred directly to the Government; (5) when access to proprietary financial information or other proprietary data is required except for authorized audit rights; and (6) where specifically modified herein.

9.19.1 Applicable to All Subcontracts

CLAUSE	TITLE
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)
52.223-3	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997) – ALT 1 (JUL 1995)
522.22	PRIVACY ACT NOTIFICATION (APR 1984)
52.224-2	PRIVACY ACT (APR 1984)
52.225-11	BUY AMERICAN ACT – CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS AND NORTH AMERICAN FREE TRADE AGREEMENT (JUN 1997)
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (DEC 2003)
52.227-4	PATENT INDEMNITY-CONSTRUCTION CONTRACTS (APR 1984)
52.242-13	BANKRUPTCY (JUL 1995)
52-244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS (JUL 2004)
952.203-70	WHISTLEBLOWER PROTECTION FOR CONTRACTOR EMPLOYEES (DEC 2000)
952.204-2	SECURITY (MAY 2002)
952.208-70	PRINTING (APR 1984)
952.217-70	ACQUISITION OF REAL PROPERTY (APR 1984)
952.227-82	RIGHTS TO PROPOSAL DATA (APR 1994)
970.5223-4	WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (DEC 2000)
970-5232-3	ACCOUNTS, RECORDS, AND INSPECTION (DEC 2000)
CRD M 442.1-1	DIFFERING PROFESSIONAL OPINIONS MANUAL FOR TECHNICAL ISSUES INVOLVING ENVIRONMENT, SAFETY AND HEALTH
CRD O 450.1A	ENVIRONMENTAL PROTECTION PROGRAM

9.19.2 Applicable to Subcontracts over \$2,000 Where the Davis-Bacon Act Applies

CLAUSE	TITLE
52.222-6	DAVIS-BACON ACT (FEB 1995)
52.222-7	WITHHOLDING OF FUNDS (FEB 1988)
52.222-8	PAYROLLS AND BASIC RECORDS (FEB 1988)
52.222-9	APPRENTICES AND TRAINEES (FEB 1988)
52.222-10	COMPLIANCE WITH COPELAND REGULATIONS (FEB 1988)
52.222-11	SUBCONTRACTS LABOR STANDARDS (FEB 1988)
52.222-12	CONTRACT TERMINATION-DEBARMENT (FEB 1988)
52.222-13	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
52.222-14	DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
52.222-15	CERTIFICATION OF ELIGIBILITY (FEB 1988)
52.222-16	APPROVAL OF WAGE RATES (FEB 1988)
53.222(e)	APPLICATION OF LABOR LAWS TO GOVERNMENT ACQUISITIONS
952.222-39	NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES (DEC 2004)

CLAUSE	TITLE
970.5223-1	INTEGRATION OF ENVIRONMENT, SAFETY AND HEALTH INTO WORK PLANNING AND EXECUTION

9.19.3 Applicable to Subcontracts over \$2,500

CLAUSE	TITLE
52.222-3	CONVICT LABOR (JUN 2003)

9.19.4 Applicable to Subcontracts over \$2,500 Where the Service Contract Act Applies

CLAUSE	TITLE
52.222-41	SERVICE CONTRACT ACT OF 1965, AS AMENDED (MAY 1989)

9.19.5 Applicable to Subcontracts over \$3,000

CLAUSE	TITLE
52.222-54	EMPLOYMENT ELIGIBILITY VERIFICATION

9.19.5 Applicable to Subcontracts over \$10,000

CLAUSE	TITLE
52.222-21	PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)
52.222-26	EQUAL OPPORTUNITY (APR 2002)
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

9.19.6 Applicable to Subcontracts over \$25,000

CLAUSE	TITLE
52.222-35	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)

9.19.7 Applicable to Subcontracts over \$100,000

CLAUSE	TITLE	INSTRUCTIONS
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)	
52.203-7	ANTI-KICKBACK PROCEDURES (JUL 1995)	Add to (c)(2): "Seller shall notify Buyer when such action has been taken." In the first sentence of (c)(4) 'the Contract Officer may...' is replaced by 'after the Contracting Officer has effected an offset at the prime contract level or has directed Buyer to withhold any sum from the Seller, Buyer shall...'
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)	
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 2003)	

CLAUSE	TITLE	INSTRUCTIONS
52.215-2	AUDIT AND RECORDS – NEGOTIATIONS (JUNE 1999)	
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2001)	
52.222-4	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT – OVERTIME COMPENSATION (SEP 2000)	
52.223-14	TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)	
52.227-1	AUTHORIZATION AND CONSENT (JUL 1995)	
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)	

9.19.8 Applicable to Subcontracts over \$500,000

CLAUSE	TITLE
52.230-6	ADMINISTRATION OF COST ACCOUNTING STANDARDS (NOV 1999) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)
952.226-74	DISPLACED EMPLOYEE HIRING PREFERENCE (JUNE 1997)
970.5226-2	WORKFORCE RESTRUCTURING UNDER SECTION 3161 OF THE NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1993 (DEC 2000)
52.219-9	SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) ALTERNATIVE II (OCT 2001) Threshold for Construction is \$1,000,000. (Does not apply to small business or those instances where subcontracting opportunities are not available at the time of award.)

9.19.9 Applicable to Subcontracts over \$550,000

CLAUSE	TITLE
52.215-10	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)
52.215-11	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-13	SUBCONTRACTOR COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-15	PENSION ADJUSTMENTS AND ASSET REVERSIONS (JAN 2004)
52.215-18	REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)
52.215-19	NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

9.19.10 Applicable to Subcontracts over \$650,000

CLAUSE	TITLE
52.230-2	COST ACCOUNTING STANDARDS (APR 1998) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)

9.19.11 Applicable to Subcontracts Where Nuclear Hazards May Exist

CLAUSE	TITLE
952.223-75	PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)
952.250-70	NUCLEAR HAZARDS INDEMNITY AGREEMENT (OCT 2005)

9.19.12 Applicable to Subcontracts Where Government Property is Provided

CLAUSE	TITLE
52.244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS) (MAY 2004)
52.244-1	PROPERTY RECORDS (APR 1984) (Only applicable when WCH maintains the official property records.)
52.245-25	LIMITATION OF LIABILITY – SERVICES (FEB 1997)
952-244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-MATERIAL, OR LABOR-HOUR CONTRACTS)

9.19.13 Applicable to Subcontracts Where Technical Data or Computer Software will be Produced, Furnished or Acquired

CLAUSE	TITLE
52.227-14	RIGHTS IN DATA GENERAL (JUNE 1987) ALTERNATIVE V (JUNE 1987) AS MODIFIED PURSUANT TO DEAR 927.409 (a)

9.19.14 Applicable to Cost Reimbursement Subcontracts

CLAUSE	TITLE	INSTRUCTIONS
52.216-7	ALLOWABLE COST AND PAYMENT (DEC 2002)	(a) (3) 30 days
52.216-8	FIXED FEE (MAR 1997)	
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)	
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)	
52.244-2	SUBCONTRACTS (AUG 1998) – ALTERNATE II (AUG 1998)	
952.216-7	ALLOWABLE COST AND PAYMENT (JAN 1997) – ALTERNATE II	
952.251-70	CONTRACTOR EMPLOYEE TRAVEL DISCOUNTS (JUNE 1995)	
970.5204-3	ACCESS TO AND OWNERSHIP OF RECORDS (DEC 2000)	(b)(1) through (b)(5) are Subcontractor-owned records.

9.19.15 Applicable to Time and Material Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002)
52.24215	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)

9.19.16 Applicable to Labor-Hour Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002) ALTERNATE II (FEB 2002)
52.242-15	STOP-WORK ORDER (AUG 1989) - ALTERNATE I (APR 1984)

///

EXHIBIT A

CONSTRUCTION SUBCONTRACTS GENERAL CONDITIONS

DO NOT ALTER THIS DOCUMENT

REV.	DATE	Explanation	Originator	Checker
06	July 7, 2009	Correction of Typographical Error	L. Cortez	D. Houston
05	July 29, 2008	Requisition Improvement Initiative	L. Cortez	D. Houston
River Corridor Closure Project			Subcontractor Terms & Conditions	

EXHIBIT "A"

WASHINGTON CLOSURE HANFORD, LLC

CONSTRUCTION SUBCONTRACTS

GENERAL CONDITIONS

**FOR CONSTRUCTION QUALITY ASSURANCE
R013213A00**

WASHINGTON CLOSURE HANFORD LLC

EXHIBIT "A"

TABLE OF CONTENTS

1.0	SCOPE.....	1
2.0	STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES.....	1
3.0	DEFINITIONS.....	1
4.0	ENTIRE AGREEMENT.....	1
5.0	SUBCONTRACT INTERPRETATION.....	2
6.0	ORDER OF PRECEDENCE.....	2
7.0	THE SUBCONTRACTOR.....	2
GC 7.1	Independent Contractor.....	2
GC 7.2	Permits and Licenses.....	2
GC 7.3	Labor, Personnel, and Site Work Rules or WCH Policy.....	3
GC 7.4	Hanford Site Training.....	3
GC 7.5	Security.....	3
GC 7.6	Environment, Safety and Health.....	6
GC 7.7	Site Conditions and Natural Resources.....	7
GC 7.8	Differing Site Conditions.....	7
GC 7.9	Environmental Conditions.....	8
GC 7.10	Cultural Resources Awareness.....	9
GC 7.11	Worker Safety and Health Program (Civil Penalties Under 10 CFR 851.....	9
GC 7.12	Survey Control Points and Layouts.....	10
GC 7.13	SUBCONTRACTOR'S Work Area.....	10
GC 7.14	Cleaning Up.....	10
GC 7.15	Responsibility for Security of Work and Property.....	10
GC 7.16	SUBCONTRACTOR'S Plant, Equipment, and Facilities.....	11
GC 7.17	Illumination.....	12
GC 7.18	Use of CONTRACTOR'S Construction Equipment or Facilities.....	12
GC 7.19	Warranty.....	12
GC 7.20	Inspection, Quality Surveillance, Rejection of Materials and Workmanship.....	13
GC 7.21	Testing.....	13
GC 7.22	Expediting.....	13
GC 7.23	Progress.....	14
GC 7.24	Excusable Delays.....	14
GC 7.25	Cooperation with Others.....	14
GC 7.26	Use of Completed Portions of Work.....	14
GC 7.27	Suspension.....	15
GC 7.28	Commercial Activities.....	16
GC 7.29	Publicity and Advertising.....	16
GC 7.30	Quality Assurance Program.....	16
GC 7.31	SUBCONTRACTOR Employee Concerns Program.....	16
GC 7.32	Workers Compensation Requirements.....	17
GC 7.33	Insurance.....	17
8.0	THE CONTRACTOR.....	21
GC 8.1	Authorized Representatives.....	21
GC 8.2	Medical Examinations.....	21
GC 8.3	First Aid Facilities.....	22
GC 8.4	Notices.....	22
GC 8.5	Changes.....	22
GC 8.6	Final Inspection and Acceptance.....	23
GC 8.7	Emergency Situation.....	24
9.0	GENERAL SUBCONTRACT PROVISIONS.....	24
GC 9.1	Applicable Law.....	24
GC 9.2	Words and Phrases.....	24

GC 9.3	Taxes	25
GC 9.4	Backcharges	25
GC 9.5	Examination of SUBCONTRACTOR's Record's and Accounts.....	25
GC 9.6	Title to Materials Found	26
GC 9.7	Termination for Default	26
GC 9.8	Termination for Convenience.....	27
GC 9.9	Non-Waiver	28
GC 9.10	Indemnity, Fines and Penalties	28
GC 9.11	Patent and Intellectual Property Indemnity.....	29
GC 9.12	Assignments and Subcontracts.....	29
GC 9.13	Survival.....	29
GC 9.14	Disputes.....	30
GC 9.15	Nondisclosure.....	30
GC 9.16	Procurement Integrity	31
GC 9.17	Rights in Data	31
GC 9.18	Continuity of Service.....	31
GC 9.19	Government Flowdowns.....	31

EXHIBIT "A"
CONSTRUCTION SUBCONTRACT GENERAL CONDITIONS

1.0 SCOPE

This Exhibit A provides General Terms and Conditions that apply to all Subcontracts providing Construction technical services to Washington Closure Hanford LLC.

2.0 STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES

- 2.1 Wherever references are made in this Subcontract to standards or codes in accordance with which the Work under this Subcontract is to be performed, the edition or revision of the standards or codes current on the effective date of this Subcontract shall apply unless otherwise expressly stated. If conflict occurs between any standards and codes referenced in the Subcontract Documents and any Subcontract Documents, the latter shall govern.
- 2.2 If SUBCONTRACTOR discovers any discrepancy or inconsistency between this Subcontract and any law, ordinance, statute, rule, regulation, order or decree, SUBCONTRACTOR shall report the same immediately, in writing, to CONTRACTOR who will issue such further instructions as may be necessary..
- 2.3 In performing Work under this Subcontract, the SUBCONTRACTOR shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), in effect at the time the work under this Subcontract is performed unless relief has been granted in writing by the appropriate regulatory agency.
- 2.4 If during the term of this Subcontract there are changed or new laws, ordinances, statutes, rules, regulations, orders or decrees not known or foreseeable at the time of signing this Subcontract that become effective and that affect the cost or time of performance of this Subcontract, SUBCONTRACTOR shall immediately notify CONTRACTOR in writing and submit detailed documentation of such effect in terms of both time and cost of performing the Subcontract. If the Work is affected by such changed or new laws, ordinances, etc., and CONTRACTOR concurs with the effect of such changes, an equitable adjustment in compensation and time of performance will be made, provided the OWNER approves such equitable adjustments in compensation and time of performance.

3.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH)

"SUBCONTRACTOR" means the legal entity which contracts with WCH.

"Subcontractor's Technical Representative" means the CONTRACTOR'S authorized representative.

"GOVERNMENT/OWNER" means the United States Government and/or the Department of Energy Richland Operations Office (DOE-RL).

4.0 ENTIRE AGREEMENT

This Subcontract embodies the entire agreement between the CONTRACTOR and SUBCONTRACTOR and supersedes all other writings. The parties shall not be bound by, or be liable for any statement, representation, promise, inducement, or understanding not set forth herein.

5.0 SUBCONTRACT INTERPRETATION

All questions concerning interpretation or clarification of this Subcontract, including the discovery of conflicts, errors or omissions, or the acceptable performance thereof by SUBCONTRACTOR, shall be immediately submitted in writing to the CONTRACTOR for resolution. All determinations, instructions, and clarifications of CONTRACTOR shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. At all times SUBCONTRACTOR shall proceed with the Work in accordance with the determinations, instructions, and clarifications of CONTRACTOR. SUBCONTRACTOR shall be solely responsible for requesting instructions or interpretations and shall be solely liable for any costs and expenses arising from its failure to do so.

6.0 ORDER OF PRECEDENCE

The Subcontract Agreement form or the Master Agreement form and individual Task Order Subcontracts, all documents listed therein, and subsequently issued Change Notices and modifications are essential parts of this Subcontract or Master Agreement and Task Order Subcontracts, and a requirement occurring in one is binding as though occurring in all. In resolving conflicts, discrepancies, errors, or omissions pursuant to the General Condition titled "SUBCONTRACT INTERPRETATION," the following order of precedence shall be used:

1. Subcontract Change Notices and Modifications, if any
2. Individual Task Order Subcontracts (which may include supplements to the Master Agreement)
3. The Subcontract Agreement Form or the Master Agreement Form
4. Exhibit "H" – Hanford Site Stabilization Agreement
5. Exhibit "C" – Schedule of Quantities and Prices
6. Exhibit "B" – Special Conditions
7. Exhibit "A" – General Conditions
8. Exhibit "G" – Subcontractor Safety and Health Requirements
9. Exhibit "J" – Subcontractor Environmental and Waste Management Requirements
10. Exhibit "K" – Integrated Work Control Program Procedure PAS-2-1.1 (if applicable)
11. Exhibit "D" – Scope of Work
12. Exhibit "F" – Drawings
13. Exhibit "E" – Technical Specifications
14. Exhibit "I" – Subcontractor Submittal Requirements Summary
15. Subcontractor Submittals

7.0 THE SUBCONTRACTOR

GC 7.1 Independent Contractor

SUBCONTRACTOR represents that it is fully experienced, properly qualified, registered, licensed, equipped, organized, and financed to perform the Work under this Subcontract. Subcontractor shall act as an independent contractor and not as the agent of CONTRACTOR or OWNER in performing this Subcontract, maintaining complete control over its employees and all of its lower-tier suppliers and subcontractors. Nothing contained in this Subcontract, or any lower-tier purchase order or subcontract awarded by SUBCONTRACTOR, shall create any contractual relationship between any lower-tier supplier or subcontractor and either CONTRACTOR or OWNER. SUBCONTRACTOR shall perform the Work hereunder in accordance with its own methods subject to compliance with the Subcontract.

GC 7.2 Permits and Licenses

Except as otherwise specified, SUBCONTRACTOR shall procure and pay for all permits, licenses, and inspections, other than inspections performed by CONTRACTOR and shall furnish any bonds, security, or deposits required by the Government, state, territory, municipality, or other political subdivision to permit performance of the Work hereunder. This includes, but is not necessarily limited to, identifying if such permits and licenses are required, compiling the information and data required for applications to obtain permits and licenses, filing of necessary applications for such permits and licenses, and providing any additional information or data required.

Where permits and licenses are furnished by the CONTRACTOR or OWNER, the SUBCONTRACTOR shall provide all reasonable assistance requested, including any necessary information or data.

GC 7.3 Labor, Personnel, and Site Work Rules or WCH Policy

- 7.3.1 SUBCONTRACTOR shall employ only competent and skilled personnel to perform the Work and shall remove from the Jobsite any SUBCONTRACTOR personnel determined by the CONTRACTOR to be unfit or to be acting in violation of any provision of this Subcontract, WCH, or Hanford Site policies. SUBCONTRACTOR is responsible for maintaining labor relations in such a manner that there is harmony among workers and shall comply with and enforce Jobsite procedures, regulations, and site work rules or WCH policy established by CONTRACTOR and OWNER.
- 7.3.2 SUBCONTRACTOR shall, to the extent permissible under applicable law, comply with the provisions of all labor agreement(s), inclusive of the Hanford Site Stabilization Agreement, which apply to the Work performed under this Subcontract (e.g., Project Agreement, collective bargaining agreement(s), etc.). SUBCONTRACTOR shall pay rates of wages and shall observe hours of Work and other economic terms and conditions of employment equivalent to those paid and observed by CONTRACTOR, all of which shall be subject to CONTRACTOR'S approval.
- 7.3.3 Work assignments and the settlement of jurisdictional disputes shall conform with either the Rules, Regulations, and Procedures of the Plan for Settlement of Jurisdictional Disputes in the Construction Industry, and any successor agreement thereto, or any other mutually established method of determining work assignments and settling jurisdictional disputes.

GC 7.4 Hanford Site Training

In the performance of work under this Subcontract, SUBCONTRACTOR shall adhere to all the training requirements as outlined and stipulated under Exhibit "G", Subcontractor Safety and Health Requirements. SUBCONTRACTOR is responsible for all labor costs for employees receiving training. SUBCONTRACTOR is also responsible for tuition costs for initial and annual refresher Radworker II training. SUBCONTRACTOR is responsible for all scheduling and coordination for Radworker II training. Additionally, SUBCONTRACTOR will be responsible for all costs incurred by CONTRACTOR for failure to report (no shows) to any scheduled training by SUBCONTRACTOR'S personnel and lower-tiers. All scheduling of HGET shall be given to STR at least two weeks in advance of the HGET training needed.

GC 7.5 Security

- 7.5.1 In the performance of the Work under this Subcontract, SUBCONTRACTOR shall comply with the following requirements from the CONTRACTOR/OWNER security program:
 - 7.5.1.1 Incidents. Prompt verbal notification of incidents of loss, theft, vandalism, violence, threats, and misconduct to the CONTRACTOR, subsequently detailed in a written report.
 - 7.5.1.2 Prohibited Articles. Property passes are required for the movement of prohibited articles into and out of any areas of the Hanford Site. Prohibited articles include:
 - Dangerous weapons
 - Explosives, ammunition, and incendiary devices.
 - Controlled substances and drug paraphernalia.
 - Alcoholic beverages.
 - Contraband (includes other items prohibited by law).
- (a) The SUBCONTRACTOR will notify the CONTRACTOR if it becomes necessary to transport prohibited articles onto the Hanford Site. Upon CONTRACTOR and OWNER approval, the CONTRACTOR will issue the appropriate property pass. SUBCONTRACTOR employees transporting prohibited articles within the Hanford Site must have a valid property pass in their possession.

- (b) SUBCONTRACTOR employees and employees of its lower-tier subcontractors discovered on the Hanford Site in possession of any prohibited article, and not in possession of a valid property pass, shall have their badge and prohibited article returned to the OWNER and their access to the Hanford Site suspended. If it is legally allowable for the individual to possess the prohibited article, the badge and prohibited article will be returned within two working days. If it is illegal for the individual to possess the prohibited article, the prohibited article will be turned over to local law enforcement and the individual's access to the Hanford Site will be denied for a minimum of one (1) year.

7.5.1.3

Security Badges. Any person assigned to work on the Hanford Site or any designated CONTRACTOR facility shall be required to wear a CONTRACTOR issued security badge identifying him/her. If any such persons are foreign nationals, special procedures shall apply when applying for and receiving a security badge. The identification badge shall be worn in plain view, above the waist, on the front of the body, on the outer most layer of clothing. If required, a dosimeter will be issued in conjunction with the security badge.

- (a) Badging for more than seven (7) days requires SUBCONTRACTOR employees, and employees of their lower-tier subcontractors, vendors, and visitors to complete Hanford General Employee Training (HGET).
- (b) SUBCONTRACTOR shall provide to CONTRACTOR the individual(s) complete name (as it appears on the photo identification to be used), name and address of the company being represented, reason for access, social security number, date of birth (mm/dd/yyyy), place of birth (city, state/province, country), and citizenship of the individual(s) requiring a badge at least two (2) working days prior to the date the employee(s) first require the badge(s) for work performance.
- (c) It is the responsibility of the SUBCONTRACTOR to provide the CONTRACTOR with a minimum of two (2) weeks notice if the SUBCONTRACTOR will be requesting access to the work site for a foreign national. This will extend to six (6) weeks notice if the foreign national is from a sensitive country as defined by the OWNER.
- (d) Badges will be issued by CONTRACTOR at locations and according to schedules provided by the CONTRACTOR. Central Badging Office hours are normally 7:00 a.m. through 4:30 p.m., Monday through Thursday, and 7:00 a.m. through 3:30 p.m., Friday. CONTRACTOR temporary badging hours are normally 6:30 a.m. through 5:00 p.m., Monday through Thursday.
- (e) The employee, vendor, or visitor must appear in person to obtain a badge. Badge applicants must provide proof of identification and completion of HGET to the issuing office.
- (f) The OWNER will issue security badges free of charge.
- (g) Security badges will be valid only for the duration of a specific Subcontract or for one (1) calendar year from the date of issuance, whichever ends first. If a Subcontract extends beyond one (1) year, SUBCONTRACTOR employees must obtain a new badge prior to the expiration date of the current badge.
- (h) A new security badge must be obtained whenever there is a significant change in facial appearance, e.g., growth or removal of facial hair, changes resulting from surgery, etc.
- (i) U.S. Department of Energy (DOE) security badges are the property of the Government and must be returned to the CONTRACTOR whenever an individual is transferred, terminates employment or otherwise no longer requires the badge. Badges of departing visitors shall be turned over to CONTRACTOR or security force personnel at the conclusion of the visit at the final security checkpoint. It is the responsibility of the

SUBCONTRACTOR to implement a Badge Recovery Policy to ensure its employees, vendors and sub-tier personnel:

- Report a lost or stolen badge to the CONTRACTOR'S representative within twenty-four (24) hours of discovery,
- Return the security badge to the CONTRACTOR when no longer valid or when requested to by CONTRACTOR, OWNER, and/or protective (security) force personnel.

(j) A charge of \$1,000.00 will be assessed to the SUBCONTRACTOR for each security badge that is not returned. Such charges will be deducted from payments otherwise due the SUBCONTRACTOR. Refund of charges, previously collected for badges and/or dosimeters subsequently found may not be made after the date of final payment to the SUBCONTRACTOR.

(k) The SUBCONTRACTOR is responsible for all labor costs associated with the badging and security training requirements.

7.5.1.4 Security Orientation. Each SUBCONTRACTOR visitor/vendor, and visitor/vendors of their lower-tier subcontractors, will receive a security orientation booklet from the CONTRACTOR or OWNER prior to being issued a visitor security badge.

7.5.1.5 Computer Security. Each SUBCONTRACTOR employee, and employees of their lower-tier subcontractors that are granted access to the CONTRACTOR or OWNER information networks, are required to adhere to the restrictions and limitations of the CONTRACTOR computer security program. These requirements can be obtained from the CONTRACTOR Computer Protection Program Manager.

7.5.1.6 "Official Use Only" Information Security. Each SUBCONTRACTOR employee, and employees of their subcontractors that are granted access to "Official Use Only" sensitive unclassified information provided by the CONTRACTOR/OWNER of the information must adhere to the restrictions and limitations of the CONTRACTOR regarding the access, control, and destruction of the information. These requirements include ensuring that any SUBCONTRACTOR employee or employees of their subcontractors having access to the information meet the following requirements:

- (a) The employee granted access to the information has a need to know.
- (b) Advise the employee not to divulge the information to persons who do not have a need to know.
- (c) Provide protection against theft or unauthorized removal/distribution of the information.
- (d) When use of the information is completed, any documents or data shall be destroyed by shredding in accordance with established procedures.

7.5.1.7 A Security Program Plan shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any even prior to commencing Work at the Jobsite. The Program Plan shall include a description of how the SUBCONTRACTOR will implement the applicable requirements of this section and the additional requirements below.

- (a) Controlled access to office, warehouse, material and equipment sites.
- (b) Accountability procedures for the requisition and issue of materials.
- (c) Periodic security checks for all work areas assigned to SUBCONTRACTOR.

(d) Prompt reporting of incidents of loss, theft, or vandalism to CONTRACTOR, subsequently detailed in writing.

(e) Coordination and compliance with Site security programs.

7.5.2 The written Security Program Plan is set forth in Exhibit I and is a required Subcontractor Submittal.

7.5.3 Security of Work. SUBCONTRACTOR shall, at all times, conduct all operations under this Subcontract in a manner to avoid the risk of loss, theft, or damage by vandalism, sabotage, or any other means to any work, materials, equipment, or other property at the Jobsite. SUBCONTRACTOR shall continuously inspect all Work, materials and equipment to discover and determine any conditions that might involve such risks and shall be solely responsible for discovery, determination, and correction of any such conditions.

7.5.4 SUBCONTRACTOR shall comply with CONTRACTOR'S security requirements for the Jobsite. SUBCONTRACTOR shall cooperate with CONTRACTOR on all security matters and shall promptly comply with any project security arrangements established by CONTRACTOR or OWNER. Such compliance with these security requirements shall not relieve SUBCONTRACTOR of its responsibility for maintaining proper security for the above-noted items, nor shall it be construed as limiting in any manner SUBCONTRACTOR'S obligation with respect to all applicable laws and regulations and to undertake reasonable action to establish and maintain security conditions at the Jobsite.

7.5.5 The CONTRACTOR may also require that the SUBCONTRACTOR be removed from the job, at no additional cost to CONTRACTOR, employees who endanger persons or property, disruptive to the workforce, or whose continued employment under this Subcontract is inconsistent with the requirements of the Subcontract and/or interests of safety or security at the Hanford Site.

GC 7.6 Environment, Safety and Health

CONTRACTOR sets forth its full requirements for environment, safety and health in Exhibit "G", "Subcontractor Safety and Health Requirements," and Exhibit "J", "Subcontractor Environmental and Waste Management Requirements." These Exhibits, if included in this Subcontract, are fully integrated and a part hereof. The contents of Exhibit "G" and Exhibit "J" notwithstanding, the following applies to this Subcontract:

7.6.1 SUBCONTRACTOR shall be fully and solely responsible for conducting all operations under this Subcontract at all times in such a manner as to avoid the risk of harm to the environment, persons and/property. SUBCONTRACTOR shall continually and diligently inspect all Work, materials, and equipment to discover any conditions that might involve such risks and shall be solely responsible for discovery and correction of any such conditions.

7.6.2 SUBCONTRACTOR shall comply with CONTRACTOR'S Safety and Health Requirements including its Integrated Safety Management System (ISMS) Plan. SUBCONTRACTOR shall have sole responsibility for implementing its safety program. All of SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this General Condition titled "ENVIRONMENT, SAFETY AND HEALTH."

7.6.3 Neither CONTRACTOR nor OWNER shall be responsible for supervising the implementation of SUBCONTRACTOR'S safety program, and neither CONTRACTOR nor OWNER shall have responsibility for the safety of SUBCONTRACTOR'S or its lower-tier suppliers' or subcontractors' employees.

7.6.4 SUBCONTRACTOR'S failure to correct an unsafe condition or unsafe act or condition or act that negatively impacts the environment by its personnel after notice thereof shall be grounds for:

(a) An order to suspend the affected operations until the unsafe condition is corrected and,

(b) If the violation continues, default termination of this Subcontract for such failure under the clause entitled, "Termination for Default," below.

7.6.5 SUBCONTRACTOR shall designate one or more (as appropriate) Environmental, Safety and Health (ES&H) Representatives(s) acceptable to CONTRACTOR who shall be resident at the Jobsite, have responsibility to correct unsafe conditions or unsafe acts, act on behalf of SUBCONTRACTOR on environment, health and safety matters, and participate in periodic environment, safety and health meetings with CONTRACTOR. SUBCONTRACTOR shall instruct its personnel on the CONTRACTOR'S Health and Safety Requirements and SUBCONTRACTOR'S safety program and shall coordinate with other subcontractors on safety matters.

7.6.6 SUBCONTRACTOR shall furnish safety equipment and enforce the use of such equipment by its employees.

7.6.7 SUBCONTRACTOR shall maintain accident, injury, and any other records required by applicable laws and regulations (e.g., OSHA, etc.) or by CONTRACTOR and shall furnish CONTRACTOR a monthly summary of injuries and labor hours lost due to injuries.

GC 7.7 Site Conditions and Natural Resources

7.7.1 SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the nature and location of the Work and the general and local conditions, including, but not limited to, the following:

- (a) Transportation, access, disposal, and handling and storage of materials.
- (b) Availability and quality of labor, water, electric power and road conditions.
- (c) Climatic conditions, tides, and seasons.
- (d) River hydrology and river stages.
- (e) Physical conditions at the Jobsite and the project area as a whole.
- (f) Topography and ground surface conditions.
- (g) Equipment and facilities needed preliminary to and during the performance of the Work.
- (h) Radiological conditions of surface or subsurface.

7.7.2 The failure of SUBCONTRACTOR to acquaint itself with any applicable conditions will not relieve SUBCONTRACTOR of the responsibility for properly estimating either the difficulties or the cost of successfully performing SUBCONTRACTOR'S obligations under this Subcontract.

7.7.3 Where CONTRACTOR or OWNER has made investigations of subsurface conditions in areas where Work is to be performed under this Subcontract, such investigations are made by CONTRACTOR and OWNER for the purpose of study and design. If the records of such investigation are included in the Subcontract Documents, the interpretation of such records shall be the sole responsibility of SUBCONTRACTOR. Neither CONTRACTOR nor OWNER assumes any responsibility whatsoever in respect to the sufficiency or accuracy of such investigations, the records thereof, or of the interpretations set forth; and there is no warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such proportions different from those indicated may not be encountered.

GC 7.8 Differing Site Conditions

7.8.1 The Hanford Site was used for nuclear work related to the production of weapons for the defense of the country. Unidentified sources of radioactive material exist in Hanford Site soil. SUBCONTRACTOR

shall promptly notify CONTRACTOR, in writing, before proceeding with any Work that SUBCONTRACTOR believes constitutes a differing site condition with respect to:

- (a) Subsurface or latent physical conditions at the Jobsite differing materially from those indicated in this Subcontract, or
- (b) Previously unknown physical conditions at the Jobsite, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Subcontract, or

7.8.2 CONTRACTOR will, as promptly as practicable, investigate such conditions and make a determination. If CONTRACTOR determines that such conditions do materially so differ and cause an increase or decrease in SUBCONTRACTOR'S cost of or the time required for performance of the Work under the Subcontract, an adjustment will be made and the Subcontract modified, in writing, accordingly. No claim of SUBCONTRACTOR under this clause will be allowed unless SUBCONTRACTOR has given the required notice.

GC 7.9 Environmental Conditions

7.9.1 Throughout performance of the Work, SUBCONTRACTOR shall conduct all operations in such a way as to minimize impact upon the natural environment and prevent any spread of contaminated or hazardous material. SUBCONTRACTOR shall provide:

- (a) Dust control of its operations within work and all other areas under its control and shall coordinate and cooperate with others for dust control in common areas.
- (b) Working machinery and equipment with efficient noise suppression devices and all other noise and vibration abatement measures necessary for the protection of workers and the public.
- (c) Suitable waste, sewage, sanitary, and garbage disposal methods and procedures approved by CONTRACTOR.
- (d) Provide suitable equipment, facilities, and precautions to prevent the discharge of contaminants into the atmosphere, any body of water, or land areas.
- (e) All documentation required by all levels of governing authority of this Subcontract concerning environmental requirements.
- (f) Responsibility for developing and maintaining a written Environmental Compliance Plan in accordance with SUBCONTRACTOR'S established practices, including, but not limited to, compliance with all applicable laws and all applicable requirements in the Project Environmental Control Plan. SUBCONTRACTOR shall have sole responsibility for developing, implementing, and enforcing its Environmental Compliance Plan and SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this clause.

7.9.2 SUBCONTRACTOR shall submit its written Environmental Compliance Plan to CONTRACTOR for review before commencing work at the Jobsite. The plan shall be submitted in accordance with Exhibit I and shall include all elements set forth in Exhibit J. CONTRACTOR'S review of SUBCONTRACTOR'S Plan shall not relieve SUBCONTRACTOR of its obligation under this Subcontract or as imposed by law, and SUBCONTRACTOR shall be solely responsible for the adequacy of its Environmental Compliance Plan.

7.9.3 If SUBCONTRACTOR encounters material on the Jobsite reasonably believed to be toxic or hazardous material or waste, which has not been addressed in this Subcontract, SUBCONTRACTOR shall immediately stop work in the affected area and notify CONTRACTOR and OWNER of the condition. Pending receipt of written instructions from CONTRACTOR, SUBCONTRACTOR shall not resume work in the affected area.

GC 7.10 Cultural Resources Awareness

- 7.10.1 SUBCONTRACTOR shall comply with the provisions of the Native American Graves Protection Act 25 USC 3001-3013. This act establishes statute provisions for the treatment of Native American remains and cultural objects. If during the performance of this Subcontract, SUBCONTRACTOR discovers Native American remains and/or cultural objects, SUBCONTRACTOR shall immediately cease work in the affected work area, take reasonable efforts to protect the items discovered, and notify the CONTRACTOR'S STR. Work in the affected area may be prohibited for a period not to exceed thirty (30) calendar days. Cessation of work under the provisions of this article for periods of up to thirty (30) calendar days shall not be cause for an excusable delay.
- 7.10.2 Cultural resources are known to exist on the Hanford Reservation. The SUBCONTRACTOR shall use previously disturbed areas, whenever possible, while conducting work activities. The SUBCONTRACTOR shall also ensure workers are trained to recognize culturally significant resources. CONTRACTOR shall provide one (1) hour training for SUBCONTRACTOR employees on cultural resources awareness. SUBCONTRACTOR is responsible for all labor costs associated with this training. All workers shall be directed to visually inspect for cultural resources during all work activities, particularly in undisturbed areas. If any cultural resources are encountered, work in the vicinity of the discovery shall be suspended immediately. In the event of any such discoveries, the SUBCONTRACTOR shall notify the CONTRACTOR'S onsite representative immediately.

GC 7.11 Worker Safety and Health Program (Civil Penalties Under 10 CFR 851)

- 7.11.1 Section 3173 of Public Law 107-314, Bob Stump National Defense Authorization Act of Fiscal Year 2003 amends the Atomic Energy Act (AEA) by adding Section 234C, Worker Health and Safety Rules for Department of Energy Nuclear Facilities. The Department of Energy (DOE) promulgated Procedural Rules (10 CFR 851); Worker Safety and Health Program to comply with Section 234C. These rules govern the conduct of Contractor, Subcontractor and Supplier activities at DOE sites. Violation of the applicable rules will provide a basis for the assessment of civil penalties under the CFR ruling on Contractors, Subcontractors and Suppliers. Title 10 CFR 851 sets forth the procedures DOE (OWNER) will use in exercising its enforcement authority, including the issuance of "Notices of Violation" and the resolution of an administrative appeal in the event the Contractor or Subcontractor elects to petition the Office of Hearings and Appeals for Review.
- 7.11.2 This Subcontract or Purchase Order is subject to the requirements of 10 CFR 851, if under its terms the Supplier or Subcontractor is required to perform work at the Hanford Site.
- 7.11.3 DOE (OWNER) may assess civil penalties of up to \$70,000 per violation per day. If any violation is a continuing violation, each day of the violation shall constitute a separate violation for the purpose of computing the civil penalty.
- A. A Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists or from one or more practices, means, methods, operations or processes which have been adopted or are in use, in such a place of employment. Severity Level I violation would be subject to the base civil penalty of up to 100% of the maximum base civil penalty of \$70,000.
- B. A Severity Level II violation is an other than serious violation. An other than serious violation occurs where the most serious injury or illness that would potentially result from a hazardous condition cannot be reasonably predicted to cause death or serious physical harm to employees but does have a direct relationship to their safety and health. A Severity Level II violation would be subject to the base civil penalty of up to 50% of the maximum base civil penalty or \$35,000.
- 7.11.4 Indemnification of Contractor (WCH). To the extent permitted by law, Subcontractor or Supplier assumes full responsibility and shall indemnify, hold harmless and defend WCH and its principal subcontractors, their agents, officers, employees, and directors from any civil liability under Section 234C of the Act or the implementing regulations at 10 CFR 851, arising out of the activities of the

SUBCONTRACTOR or Supplier, its lower tier subcontractors, suppliers, agents, employees, officers or directors to the extent that the action or inaction of the Subcontractor or Supplier is found to be a direct or indirect cause of the assessment of fines or penalties or the cause of the institution of proceedings against WCH under Sections 234C of the Act. The Subcontractor's or Supplier's obligation to indemnify and hold harmless shall expressly include attorney's fees and other reasonable costs of defending any action or proceeding instituted under Section 234C of the Act of the implementing regulations at 10 CFR 851. A copy of the implementing regulations at 10 CFR 851 will be made available to the Subcontractor or Supplier upon request.

- 7.11.5 The contents of this article are to be flowed down to all sub-tier subcontractors and suppliers at any level who will perform work at the Hanford Site.

GC 7.12 Survey Control Points and Layouts

- 7.12.1 Survey control points, as shown on the drawings, will be established by CONTRACTOR.
- 7.12.2 SUBCONTRACTOR shall complete the layout of all Work and shall be responsible for all requirements necessary for the Work execution in accordance with the locations, lines, and grades specified or shown on the drawings, subject to such modifications as CONTRACTOR may require as Work progresses.
- 7.12.3 If SUBCONTRACTOR or any of its lower-tier subcontractors or any of their representatives or employees move or destroy or render inaccurate any survey control point, such control point shall be replaced by CONTRACTOR at SUBCONTRACTOR'S expense. No separate payment will be made for survey Work performed by SUBCONTRACTOR.

GC 7.13 SUBCONTRACTOR'S Work Area

All SUBCONTRACTOR Work areas on the Jobsite will be assigned by CONTRACTOR. SUBCONTRACTOR shall confine its operations to the areas so assigned. Should SUBCONTRACTOR find it necessary or advantageous to use any additional off-site area for any purpose whatsoever, SUBCONTRACTOR shall, at its expense, provide and make its own arrangements for the use of such additional off-site areas.

GC 7.14 Cleaning Up

- 7.14.1 SUBCONTRACTOR shall, at all times, keep its Work areas in a neat, clean, and safe condition.
- 7.14.2 Upon completion of any portion of the Work, SUBCONTRACTOR shall promptly remove from the Work area all its equipment, construction plant, temporary structures, and surplus materials not to be used at or near the same location during later stages of the Work.
- 7.14.3 Upon completion of the Work and before final payment, SUBCONTRACTOR shall, at its expense, satisfactorily dispose of all rubbish, remove all plant, buildings, equipment, and materials belonging to SUBCONTRACTOR and return to CONTRACTOR'S warehouse or Jobsite storage area all salvageable CONTRACTOR- or OWNER-supplied materials. SUBCONTRACTOR shall leave the premises in a neat, clean, and safe condition.
- 7.14.4 If SUBCONTRACTOR fails to comply with the foregoing, CONTRACTOR will accomplish same at SUBCONTRACTOR'S expense.

GC 7.15 Responsibility for Security of Work and Property

- 7.15.1 Work in Progress, Materials and Equipment. SUBCONTRACTOR shall be responsible for and shall bear any and all risk of loss of or damage to Work in progress, all materials delivered to the Jobsite, and all materials and equipment until completion and final acceptance of the Work under this Subcontract.

7.15.2 Delivery, Unloading and Storage. SUBCONTRACTOR'S responsibility for materials and plant equipment required for the performance of this Subcontract shall include:

- (a) Receiving and unloading.
- (b) Storing in a secure place and in a manner subject to CONTRACTOR'S review. Outside storage of materials and equipment subject to degradation by the elements shall be in weather-tight enclosures provided by SUBCONTRACTOR.
- (c) Delivering from storage to construction site all materials and plant equipment as required.
- (d) Maintaining complete and accurate records for CONTRACTOR'S inspection of all materials and plant equipment received, stored, and issued for use in the performance of the Subcontract.

7.15.3 Property. SUBCONTRACTOR shall plan and conduct its operations so as not to:

- (a) Enter upon lands in their natural state unless authorized by CONTRACTOR.
- (b) Damage, close, or obstruct any utility installation, highway, road, or other property until permits have been obtained.
- (c) Disrupt or otherwise interfere with the operation of any pipeline, telephone, electric transmission line, ditch, or structure unless otherwise specifically authorized by this Subcontract.
- (d) Damage or destroy cultivated and planted areas, and vegetation such as trees, plants, shrubs, and grass on or adjacent to the premises which, as determined by CONTRACTOR, do not interfere with the performance of this Subcontract. This includes damage arising from performance of Work by operating equipment or stockpiling materials.

SUBCONTRACTOR shall not be entitled to any extension of time or compensation on account of SUBCONTRACTOR'S failure to protect all materials, equipment, and environment, as described herein. All costs in connection with any repairs or restoration necessary or required by reason of unauthorized obstruction, damage, or use shall be borne by SUBCONTRACTOR.

GC 7.16 SUBCONTRACTOR'S Plant, Equipment, and Facilities

- 7.16.1 SUBCONTRACTOR shall provide and use for the Work hereunder only such construction plant and equipment as are capable of producing the quality and quantity of Work and materials required by this Subcontract and within the time or times specified in the Subcontract Schedule.
- 7.16.2 Before proceeding with the Work hereunder, SUBCONTRACTOR shall furnish CONTRACTOR with information and drawings relative to such equipment, plant and facilities as CONTRACTOR may request. Upon written order of CONTRACTOR, SUBCONTRACTOR shall discontinue operation of unsatisfactory plant, equipment, or facilities and shall either modify the unsatisfactory items or remove such items from the Jobsite.
- 7.16.3 SUBCONTRACTOR shall, at the time any equipment is moved onto the Jobsite, present to CONTRACTOR an itemized list of all equipment and tools, including, but not limited to, power tools, welding machines, pumps, and compressors. Said list must include description and quantity, and serial number where applicable. It is recommended that SUBCONTRACTOR identify its equipment by color (other than yellow), decal, and etching. Before removing any or all equipment, SUBCONTRACTOR shall clear such removal through CONTRACTOR.
- 7.16.4 SUBCONTRACTOR shall not remove construction plant, equipment, or tools from the Jobsite before the Work is finally accepted, without CONTRACTOR'S written approval. SUBCONTRACTOR shall obtain CONTRACTOR'S radiological release of all equipment used in radiological areas before removal.

GC 7.17 Illumination

When any Work is performed at night or where daylight is obscured, SUBCONTRACTOR shall, at its expense, provide artificial light sufficient to permit Work to be carried on efficiently, satisfactorily, and safely, and to permit thorough inspection. During such time periods, the access to the place of Work shall also be clearly illuminated. All wiring for electric light and power shall be installed and maintained in a safe manner and meet all applicable codes and standards.

GC 7.18 Use of CONTRACTOR's Construction Equipment or Facilities

Where SUBCONTRACTOR requests CONTRACTOR and CONTRACTOR agrees to make available to SUBCONTRACTOR certain equipment or facilities belonging to CONTRACTOR for the performance of SUBCONTRACTOR Work under the Subcontract, the following shall apply:

- (a) Equipment or facilities will be charged to SUBCONTRACTOR at agreed rental rates.
- (b) CONTRACTOR will furnish a copy of the equipment maintenance and inspection record, and these records shall be maintained by SUBCONTRACTOR during the rental period.
- (c) SUBCONTRACTOR shall assure itself of the condition of such equipment and assume all risks and responsibilities during its use.
- (d) SUBCONTRACTOR shall, as part of its obligation under the General Condition clause titled "INDEMNITY," release, defend, indemnify, and hold harmless CONTRACTOR and OWNER from all claims, demands and liabilities arising from the use of such equipment.
- (e) CONTRACTOR and SUBCONTRACTOR shall jointly inspect such equipment before its use and upon its return. The cost of all necessary repairs or replacement for damage other than normal wear shall be at SUBCONTRACTOR'S expense.
- (f) If such equipment is furnished with an operator, the services of such operator will be performed under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than the payment of wages, Workers' Compensation Insurance, or other benefits.

GC 7.19 Warranty

- 7.19.1 SUBCONTRACTOR warrants to CONTRACTOR and OWNER that equipment and materials furnished under this Subcontract shall be new, of clear title, and of the most suitable grade of their respective kinds for their intended uses, unless otherwise specified. All workmanship shall be first class and performed in accordance with sound construction practices acceptable to CONTRACTOR. All equipment, materials, and workmanship shall also conform to the requirements of this Subcontract.
- 7.19.2 SUBCONTRACTOR warrants all equipment and material it furnishes and all work it performs against defects in design, equipment, materials, or workmanship either for a period from Work commencement to a date twelve (12) months after Final Acceptance of the Project as a whole by OWNER or the standard commercial warranty period, whichever is more advantageous to the CONTRACTOR.
- 7.19.3 If at any time during the warranty period, CONTRACTOR, OWNER, or SUBCONTRACTOR discover any defect in the design, equipment, materials, or workmanship, immediate notice shall be given to the other parties, SUBCONTRACTOR shall, within a reasonable time, propose corrective actions to cure such defects to meet the requirements of this Subcontract.
- 7.19.4 CONTRACTOR, at its sole discretion, may direct SUBCONTRACTOR in writing and SUBCONTRACTOR agrees to:
 - (a) Rework, repair, or remove and replace defective equipment and materials or re-perform defective workmanship to acceptable quality at a time and in a manner acceptable to CONTRACTOR.

- (b) Cooperate with others assigned by CONTRACTOR to correct such defects and pay to CONTRACTOR all actual costs reasonably incurred by CONTRACTOR in performing or in having performed corrective actions.
- (c) Propose and negotiate in good faith an equitable reduction in the Subcontract price in lieu of corrective action.

7.19.5 All costs incidental to corrective actions, including demolition for access, removal, disassembly, transportation, reinstallation, reconstruction, retesting, and reinspection, as may be necessary to correct the defect and to demonstrate that the previously defective work conforms to the requirements of this Subcontract, shall be borne by SUBCONTRACTOR.

7.19.6 SUBCONTRACTOR further warrants any and all corrective actions it performs against defects in design, equipment, materials, and workmanship for an additional period of twelve (12) months following acceptance by CONTRACTOR of the corrected Work or standard commercial warranty on product meeting standard warranty.

GC 7.20 Inspection, Quality Surveillance, Rejection of Materials and Workmanship

7.20.1 All material and equipment furnished and Work performed shall be properly inspected by SUBCONTRACTOR at its expense, and shall at all times be subject to quality surveillance and quality audit by CONTRACTOR, OWNER, or their authorized representatives who shall be afforded full and free access to the shops, factories, or other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for such quality surveillance or audit. SUBCONTRACTOR shall provide safe and adequate facilities, drawings, documents, and samples as requested, and shall provide assistance and cooperation, including stoppage of Work to perform such examination (as may be necessary) to determine compliance with the requirements of this Subcontract. Any Work covered before any scheduled quality surveillance or test by CONTRACTOR or OWNER shall be uncovered and replaced at the expense of SUBCONTRACTOR. Failure of CONTRACTOR or OWNER to make such quality surveillance or to discover defective design, materials, or workmanship shall not relieve SUBCONTRACTOR of its obligations under this Subcontract nor prejudice the rights of CONTRACTOR or OWNER thereafter to reject or require the correction of defective Work in accordance with the provisions of this Subcontract.

7.20.2 If any Work is determined by CONTRACTOR or OWNER to be defective or not in conformance with this Subcontract, the provisions of the General Condition clause titled "WARRANTY" shall apply.

GC 7.21 Testing

7.21.1 Unless otherwise provided in the Subcontract, testing of materials or Work shall be performed by SUBCONTRACTOR at its expense and in accordance with Subcontract requirements. Should tests (in addition to those required by this Subcontract) be desired by CONTRACTOR, SUBCONTRACTOR will be advised in ample time to permit such testing. Such additional tests will be at CONTRACTOR'S expense.

7.21.2 SUBCONTRACTOR shall furnish samples, as requested, and shall provide reasonable assistance and cooperation necessary to permit tests to be performed on materials or Work in place, including reasonable stoppage of Work during testing.

GC 7.22 Expediting

The material and equipment furnished and Work performed under this Subcontract shall be subject to expediting by CONTRACTOR or its representatives who shall be allowed full and free access to the shops, factories, and other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for expediting purposes. As required by CONTRACTOR, SUBCONTRACTOR shall provide detailed schedules and progress reports for use in expediting and shall cooperate with CONTRACTOR in expediting activities.

GC 7.23 Progress

- 7.23.1 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR who shall thereupon take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the currently approved Subcontract Schedule, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of Work per week, and an increase in the amount of construction plant and equipment, all without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of Work and rate of progress required by this Subcontract.
- 7.23.2 Failure of SUBCONTRACTOR to comply with CONTRACTOR'S instructions may be grounds for determination by CONTRACTOR that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate, in accordance with the applicable provisions of this Subcontract, SUBCONTRACTOR'S right to proceed with the performance of the Subcontract.

GC 7.24 Excusable Delays

If SUBCONTRACTOR'S performance of this Subcontract is prevented or delayed by any unforeseeable cause, existing or future, which is beyond the reasonable control of the parties and without the fault or negligence of SUBCONTRACTOR, SUBCONTRACTOR shall, within twenty-four (24) hours of the commencement of any such delay, give to CONTRACTOR written notice thereof and within seven (7) calendar days of commencement of the delay, a written description of the anticipated impact of the delay on performance of the Work. Delays attributable to and within the control of SUBCONTRACTOR'S suppliers or subcontractors of any tier shall be deemed delays within the control of SUBCONTRACTOR. Radiological survey time to release personnel, materials, equipment or facilities from known radiological areas shall not be considered excusable delays. Within seven (7) calendar days after the termination of any excusable delay, SUBCONTRACTOR shall file a written notice with CONTRACTOR specifying the actual duration of the delay. Failure to give any of the above notices shall be sufficient ground for denial of an extension of time. If CONTRACTOR determines that the delay was unforeseeable, beyond the control and without the fault or negligence of SUBCONTRACTOR, CONTRACTOR will determine the duration of the delay and will extend the time of performance of this Subcontract by modifying the Special Condition clause titled "COMMENCEMENT, PROGRESS, AND COMPLETION OF THE WORK," accordingly. Such extension shall be the sole remedy for the delay.

GC 7.25 Cooperation with Others

The CONTRACTOR may undertake or award other Subcontracts for other work or services. CONTRACTOR, OWNER, and other contractors may be working at the Jobsite during the performance of this Subcontract and SUBCONTRACTOR Work or use of certain facilities may be interfered with as a result of such concurrent activities. SUBCONTRACTOR shall fully cooperate with the other subcontractors and with CONTRACTOR employees. CONTRACTOR reserves the right to require SUBCONTRACTOR to schedule the order of performance of the Work to minimize interference with Work of any of the parties involved. The SUBCONTRACTOR shall not commit any act that will interfere with the performance of work by any other subcontractor or by CONTRACTOR employees.

GC 7.26 Use of Completed Portions of Work

- 7.26.1 Whenever, as determined by CONTRACTOR, any portion of the Work performed by SUBCONTRACTOR is suitable for use, CONTRACTOR or OWNER may occupy and use such portion. Use shall not constitute acceptance, relieve SUBCONTRACTOR of its responsibilities, or act as a waiver by CONTRACTOR of any of the terms of the Subcontract.
- 7.26.2 If, as a result of SUBCONTRACTOR'S failure to comply with the provisions of this Subcontract, such use proves to be unsatisfactory to CONTRACTOR or OWNER, CONTRACTOR or OWNER shall have the right to continue such use until such portion of the Work can, without injury to CONTRACTOR or

OWNER, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary, for such portion of the Work to comply with the Subcontract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve (12) months unless otherwise mutually agreed in writing between the parties.

- 7.26.3 SUBCONTRACTOR shall not use any permanently installed equipment unless such use is approved in writing by CONTRACTOR. When such use is approved, SUBCONTRACTOR shall at SUBCONTRACTOR'S expense, properly use and maintain and, upon completion of such use, recondition such equipment as required to meet specifications.
- 7.26.4 If CONTRACTOR or OWNER furnishes an operator for such equipment, all services performed shall be under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than payment of such operator's wages, Worker's Compensation Insurance, or other benefits paid directly or indirectly by CONTRACTOR or OWNER.

GC 7.27 Suspension

- 7.27.1 CONTRACTOR may, by written notice to SUBCONTRACTOR, suspend at any time the performance of all or any portion of the Work to be performed under the Subcontract. Upon receipt of such notice, SUBCONTRACTOR shall, unless the notice requires otherwise:
- (a) Immediately discontinue Work on the date and to the extent specified in the notice.
 - (b) Place no further orders or subcontracts for material, services, or facilities with respect to suspended Work other than to the extent required in the notice.
 - (c) Promptly make every reasonable effort to obtain suspension upon terms satisfactory to CONTRACTOR of all orders, subcontracts and rental agreements to the extent they relate to performance of the suspended Work.
 - (d) Continue to protect and maintain the Work, including those portions on which Work has been suspended.
 - (e) Take any other reasonable steps to minimize costs associated with such suspension.
- 7.27.2 As full compensation for such suspension, SUBCONTRACTOR will be reimbursed for the following costs, excluding profit, reasonably incurred, without duplication of any item, to the extent that such costs directly result from such Work suspension:
- (a) A standby charge to be paid to SUBCONTRACTOR during the period of Work suspension, which standby charge shall be sufficient to compensate SUBCONTRACTOR for keeping, to the extent required in the suspension notice, its organization and equipment committed to the Work on a standby basis.
 - (b) All reasonable costs associated with mobilization and demobilization of SUBCONTRACTOR'S plant, forces and equipment.
 - (c) An equitable amount to reimburse SUBCONTRACTOR for the cost of maintaining and protecting that portion of the Work upon which performance has been suspended.
- 7.27.3 Upon receipt of notice to resume suspended Work, SUBCONTRACTOR shall immediately resume performance under this Subcontract to the extent required in the notice.
- 7.27.4 If the SUBCONTRACTOR intends to assert a claim for equitable adjustment under this clause, it must, within ten (10) calendar days after receipt of notice to resume Work, submit to CONTRACTOR a written statement setting forth the schedule impact and monetary extent of such claim in sufficient

detail to permit thorough analysis. No adjustment shall be made for any suspension to the extent that performance would have been suspended, delayed, or interrupted by an SUBCONTRACTOR non-compliance with the requirements of this Subcontract.

GC 7.28 Commercial Activities

Neither SUBCONTRACTOR nor its employees shall establish any commercial activity or issue concessions or permits of any kind to third parties for establishing commercial activities on the Jobsite or any other lands owned or controlled by CONTRACTOR or OWNER.

GC 7.29 Publicity and Advertising

SUBCONTRACTOR shall not make any announcement, take any photographs, or release any information concerning this Subcontract, the Project, or any part thereof to any member of the public, press, business entity, or any official body unless prior written consent is obtained from CONTRACTOR

GC 7.30 Quality Assurance Program

7.30.1 Within thirty (30) calendar days of Subcontract award and in any event prior to commencing Work at any Work Site, SUBCONTRACTOR shall submit a Quality Assurance Program for approval consisting of the following documents:

- (a) Quality Assurance Program Manual.
- (b) Project Quality Assurance Plan.

7.30.2 The Project-specific Quality Assurance Plan (Plan) shall address all activities relevant to the Work and shall demonstrate how all work performed by SUBCONTRACTOR will conform to the Subcontract requirements. The plan shall be submitted in accordance with Exhibit I and shall contain all elements set forth in the Scope of Work.

7.30.3 The Plan shall define the documented quality system to be applied by SUBCONTRACTOR throughout the Work, in accordance with the requirements of Department of Energy (DOE) Order 414.1C.

7.30.4 The Plan shall address the interfaces between CONTRACTOR, SUBCONTRACTOR, and other relevant organizational entities. The plan shall include an organization chart showing SUBCONTRACTOR'S corporate and Project organization responsible for managing, performing and verifying the Work. The organization chart shall be supported with a reporting and functional description of SUBCONTRACTOR'S Project organization and identification of the quality-related responsibilities of key positions.

7.30.5 The Plan shall be updated as necessary throughout the Subcontract, to reflect any changes to SUBCONTRACTOR'S documented quality system. Revisions to the manual and/or Plan must be submitted to the CONTRACTOR for approval prior to implementation.

7.30.6 SUBCONTRACTOR'S documented quality system shall provide for the issuance of a "stop work" order by the SUBCONTRACTOR or CONTRACTOR at any time during the Work when significant adverse quality trends and/or deviations from the approved Quality Assurance Program are found. CONTRACTOR reserves the right to perform Quality Assurance Audits of SUBCONTRACTOR'S approved Quality Assurance Program, including lower-tier suppliers and subcontractors, at any state of the Work.

GC 7.31 SUBCONTRACTOR Employee Concerns Program

7.31.1 The SUBCONTRACTOR'S Employee Concerns Program shall conform to DOE Order 442.1 Employee Concerns Program. The CONTRACTOR reserves the right to audit the SUBCONTRACTOR'S Employee Concerns Program for compliance and implementation at any time. As directed by

CONTRACTOR, the SUBCONTRACTOR shall report and correct any deficiencies as deemed necessary.

7.31.2 As a minimum, SUBCONTRACTOR shall establish an Employee Concerns Program (ECP) that ensures employee concerns related to such issues as the environment, safety, health, and management of SUBCONTRACTOR'S programs and facilities are addressed through:

- (a) prompt identification, reporting and resolution of employee concerns regarding site facilities or operations in a manner that provides the highest degree of safe operations;
- (b) free and open expression of employee concerns that results in an independent, objective evaluation;
- (c) supplementation of existing processes with an independent avenue for reporting concerns;
- (d) employees are encouraged to first seek resolution with the first line supervisors or through existing complaint or dispute resolution systems, but that they have the right to report concerns through the DOE ECP; and
- (e) management's intolerance for reprisals against or intimidation of employees who reported concerns.

7.31.3 In support of the effective implementation of the Employee Concerns Program, SUBCONTRACTOR is required to:

- (a) assist OWNER and CONTRACTOR in the resolution of employee concerns in a manner that protects the health and safety of both employees and the public and ensures effective and efficient operation of CONTRACTOR-related activities under their jurisdiction;
- (b) ensure that SUBCONTRACTOR and lower-tier Subcontractor employees, vendors/visitors are advised that they have the right and responsibility to report concerns relating to the environment, safety, health, or management of CONTRACTOR-related activities; and
- (c) cooperate with assessments used to verify that they have acted to minimize, correct, or prevent recurrence of the situation that precipitated a valid concern.

7.31.4 The SUBCONTRACTOR is responsible for compliance with the requirements made applicable to this Subcontract regardless if the Work is completed by the SUBCONTRACTOR or its subcontractors at any tier. The SUBCONTRACTOR is responsible for flowing down the necessary provisions in this Subcontract to its subcontractors at any tier.

GC 7.32 Workers Compensation Requirements

Subcontractors will be required to provide workers' compensation in accordance with the statutes of the State of Washington (Title 51, Revised Code of Washington) for performance of work under this Subcontract including work performed by lower-tier subcontractors. SUBCONTRACTOR shall be responsible for making all payments and submitting all reports required by Title 51, Section 51.32.073, and Revised Code of Washington.

GC 7.33 Insurance

Unless otherwise specified in this Subcontract, SUBCONTRACTOR shall, at its sole expense, maintain in effect at all times during the performance of the Work insurance coverage with limits not less than those set forth below with insurers and under forms of policies satisfactory to CONTRACTOR. SUBCONTRACTOR shall deliver to CONTRACTOR no later than ten (10) calendar days after Subcontract award, but in any event before commencing the Work or entering the Jobsite, certificates of insurance as evidence that policies providing such coverage and limits of insurance are in full force and effect. Certificates shall be issued in the form provided by CONTRACTOR or if none is provided in a form acceptable to CONTRACTOR and provide that not less than thirty (30) calendar days advance written notice will be given to CONTRACTOR prior to cancellation or termination of said policies of insurance. SUBCONTRACTOR agrees to notify CONTRACTOR not less than thirty (30) days prior to any material

reduction in coverage. Certificates shall identify on their face the PROJECT NAME and the applicable SUBCONTRACT NUMBER.

7.33.1 Standard Coverage:

- A. If there is an exposure or injury to CONTRACTOR'S employees under the U.S. Longshoremen's and Harbor Worker's Compensation Act, the Jones Act or under laws, regulations, or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.
- B. SUBCONTRACTOR must have Employer's Liability of not less than \$1,000,000 each accident.
- C. General Liability Insurance:

1. Coverage

SUBCONTRACTOR shall carry Commercial General Liability Insurance covering all ongoing and completed operations by or on behalf of SUBCONTRACTOR providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and including coverage for:

- a. Premises and Operations;
- b. Products and Completed Operations
- c. Broad form or Blanket Contractual Liability;
- d. Broad form Property Damage (including Completed Operations);
- e. Explosion, Collapse and Underground Hazards; and
- f. Personal Injury Liability.

The Commercial General Liability insurance shall be written on an Occurrence Coverage Form.

2. Policy Limits

For SUBCONTRACTOR'S Commercial General Liability Insurance, the limits of liability for bodily injury, property damage, and personal injury shall be not less than:

- \$2,000,000 Combined single limit for Bodily Injury and Property Damage each occurrence;
- \$2,000,000 Personal Injury Limit each occurrence;
- \$4,000,000 Products-Completed Operations Annual Aggregate Limit; and
- \$4,000,000 General Annual Aggregate Limit (other than Products-Completed Operations).

If the policy does not have an endorsement providing the General Annual Aggregate limits on a per project basis, SUBCONTRACTOR shall provide an endorsement entitled "Amendment of Limits of Insurance (Designated Project or Premises)." Such endorsement shall provide for a Products-Completed Operations Annual Aggregate Limit of not less than \$5,000,000 and a General Annual Aggregate Limit of not less than \$5,000,000. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

3. Additional Insureds.

- a. CONTRACTOR and OWNER and their subsidiaries and affiliates, and the officers, directors and employees of the foregoing shall be named as Additional Insureds under the Commercial General Liability Insurance policy, but only with respect to liability arising out of the operations for CONTRACTOR and OWNER by or for

SUBCONTRACTOR. In the United States, Insurance Services Office (ISO) form CG 20 10 and CG 20 37 shall be attached to the policy. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insureds, be primary as regards any other coverage maintained for or by the Additional Insureds, and shall contain a cross-liability or severability of interest clause.

- b. In lieu of naming CONTRACTOR and OWNER as Additional Insureds under the Commercial General Liability policy, SUBCONTRACTOR may, at CONTRACTOR'S sole discretion and not as an option, provide Owners and Contractors Protective Liability Insurance. If SUBCONTRACTOR purchases Owners and Contractors Protective Liability Insurance for the benefit of OWNER and CONTRACTOR, the policy shall have a combined single limit for Bodily Injury or Property Damage of not less than:

\$2,000,000 Each Occurrence, and
\$2,000,000 Annual Aggregate.

- c. The Subcontract (the Work) shall be designated in the Policy Declarations and the policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Named Insured.

- D. 1. Automobile Liability Insurance, including coverage for the operation of any vehicle, shall include, but be not limited to, owned, hired and non-owned vehicles: The combined single limit for Bodily Injury and Property Damage Liability shall be not less than \$2,000,000 for any one accident or loss. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.
2. SUBCONTRACTOR'S Automobile Liability Insurance shall include coverage for Automobile Contract Liability.
3. The policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Additional Insured. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insured, be primary as regards any other coverage maintained for or by the "Additional Insured's, and shall contain a cross-liability or severability of interest clause.
- E. In the event SUBCONTRACTOR maintains insurance covering loss or damage to equipment, tools, or any other property of SUBCONTRACTOR, such insurance shall include an Insurer's waiver of subrogation in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates.

7.33.2 Special Operations Coverage. Should any of the Work:

- A. 1. Involve marine operations, SUBCONTRACTOR shall provide or have provided coverage for liabilities arising out of such marine operations, including contractual liability under its commercial General Liability Insurance or Marine Hull and Machinery Insurance, and Protection, and indemnity insurance, each with a minimum Limit of Liability of \$5,000,000. In the event such marine operations involve any SUBCONTRACTOR owned, hired, chartered, or operated vessels, barges, tugs or other marine equipment, SUBCONTRACTOR agrees to provide or have provided Marine Hull and Machinery Insurance and Protection and indemnity insurance and/or Charterer's Liability Insurance. The combined limit of the Protection and Indemnity Insurance and/or Charterer's Liability Insurance shall be no less than the market value of the vessel or \$5,000,000, whichever is greater. The Protection and Indemnity and/or Charterer's liability and Hull and Machinery coverage shall include coverage for contractual liability, wreck removal, tower's liability, if applicable, and full collision coverage, and shall be endorsed:

- a. To provide full coverage to CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured without limiting coverage to liability "as owner of the vessel" and to delete any "as owner" clause or other language that would limit coverage to liability of an insured "as owner of the vessel;" and
- b. To waive limit to full coverage for the Additional Insured provided by any applicable liability statute.

All marine insurances provided by SUBCONTRACTOR shall include an Insurer's waiver of subrogation in favor of the Additional Insured.

2. Involve the hauling of property in excess of \$300,000, SUBCONTRACTOR shall also carry "All Risk" Transit Insurance, or "All Risk" Motor Truck Cargo Insurance, or such similar form of insurance that will insure against physical loss or damage to the property being transported, moved or handled by SUBCONTRACTOR pursuant to the terms of this Subcontract.

Such insurance shall provide a limit of not less than the replacement cost of the highest value being moved, shall insure the interest of SUBCONTRACTOR, CONTRACTOR, OWNER, and the subsidiaries and affiliates of CONTRACTOR and OWNER as their respective interests may appear and shall include an insurer's waiver of subrogation rights in favor of each.

- B. Involve aircraft (fixed or rotary wing) owned, operated, or chartered by the SUBCONTRACTOR, liability arising from such aircraft shall be insured for a combined single limit not less than \$10,000,000 each occurrence, and such limit shall apply to Bodily Injury (including passengers) and Property Damage Liability. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insureds, include an Insurer's waiver of subrogation in favor of the Additional Insureds, state that it is primary insurance as regards the Additional Insureds, and contain a cross-liability or severability of interest clause. If the aircraft hull is insured, such insurance shall provide for an Insurer's waiver of subrogation rights in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates. In the event SUBCONTRACTOR charters aircraft, the foregoing insurance and evidence of insurance may be furnished by the owner of the chartered aircraft, provided the above requirements are met.
- C. Involve investigation, removal, or remedial action concerning the actual or threatened escape of hazardous substances, SUBCONTRACTOR shall also carry Pollution Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. Such insurance shall provide coverage for both sudden and gradual occurrences arising from the Work performed under this Subcontract. If Completed Operations is limited in the policy, such Completed Operation Coverage shall be for a period of not less than five (5) years. Such insurance shall include a three (3)-year extended discovery period and shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.
- D. Involve inspection, handling, or removal of asbestos, SUBCONTRACTOR shall also carry Asbestos Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. The policy shall be written on an "Occurrence Basis" with no sunset clause. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.
- E. Involve transporting hazardous substances, SUBCONTRACTOR shall also carry Business Automobile Insurance covering liability arising from transportation of hazardous materials in an amount not less than \$2,000,000 per occurrence. Such policy shall include Motor Carrier Endorsement MCS-90. NEITHER CONTRACTOR NOR OWNER IS TO BE NAMED AN ADDITIONAL INSURED FOR THIS POLICY.

- F. Involve treatment, storage, or disposal of hazardous wastes, SUBCONTRACTOR shall furnish an insurance certificate from the designated disposal facility establishing that the facility operator maintains current Environmental Liability Insurance in the amount of not less than \$5,000,000 per occurrence/annual aggregate.

7.33.3 Related Obligations

- A. The requirements contained herein as to types and limits, as well as CONTRACTOR'S approval of insurance coverage to be maintained by SUBCONTRACTOR, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by SUBCONTRACTOR under this Subcontract.
- B. The Certificates of Insurance must provide clear evidence that SUBCONTRACTOR'S Insurance Policies contain the minimum limits of coverage and the special provisions prescribed in this clause.

7.33.4 CONTRACTOR or OWNER-Furnished Insurance:

Neither CONTRACTOR nor OWNER is maintaining any insurance on behalf of SUBCONTRACTOR covering against loss or damage to the Work or to any other property of SUBCONTRACTOR unless otherwise specifically stated herein and as may be described by appendix hereto.

7.33.5 Notifications:

In accordance with the submittal requirements outlined above, SUBCONTRACTOR shall deliver the original and two (2) copies of the Certificate of Insurance required by this clause and all subsequent notices of cancellation, termination, and alteration of such policies to:

Washington Closure Hanford LLC (WCH)
2620 Fermi Avenue
Richland, WA 99354
Attention: Dana Looney Mail Stop: H4-17
Subcontract No: R013213A00

8.0 THE CONTRACTOR

GC 8.1 Authorized Representatives

Before starting Work, SUBCONTRACTOR shall designate in writing an authorized representative acceptable to CONTRACTOR to represent and act for SUBCONTRACTOR and shall specify any and all limitations of such representative's authority. Such representative shall be present or be represented at the Jobsite at all times when Work is in progress, and shall be empowered to receive communications in accordance with this Subcontract on behalf of SUBCONTRACTOR. During periods when the Work is suspended, arrangements shall be made for an authorized representative acceptable to CONTRACTOR for any emergency Work that may be required. All communications given to the authorized representative by CONTRACTOR in accordance with this Subcontract shall be binding upon SUBCONTRACTOR. CONTRACTOR shall designate, in writing, one or more representatives to represent and act for CONTRACTOR and to receive communications from SUBCONTRACTOR. Notification of changes of authorized representatives for either CONTRACTOR or SUBCONTRACTOR shall be provided in advance, in writing, to the other party.

GC 8.2 Medical Examinations

- 8.2.1 CONTRACTOR shall provide all occupational medical requirements including physical examinations through the Hanford Site Occupational Medicine Provider. Subcontractors shall contact the Subcontract Technical Representative to coordinate access to site medical services. All time spent by

SUBCONTRACTOR'S employees and transportation costs for medical examinations shall be at the expense of the SUBCONTRACTOR.

- 8.2.2 The SUBCONTRACTOR shall endeavor to employ only those persons who are physically qualified to perform work to which they are assigned at the jobsite with or without reasonable accommodation. If the SUBCONTRACTOR or CONTRACTOR determines that there may be a question of the person's physical fitness to safely perform work to be assigned, the SUBCONTRACTOR shall, with the approval of CONTRACTOR, require such employee to undergo a medical examination.
- 8.2.3 In any case where it is determined that a SUBCONTRACTOR employee is physically unable to perform the essential duties of the job, with or without reasonable accommodation, CONTRACTOR reserves the right to determine whether or not the employee may be assigned to work at the Jobsite and to determine any work assignment limitations to be imposed, and the SUBCONTRACTOR shall be responsible for enforcing CONTRACTOR'S decision.
- 8.2.4 The Hanford Site medical services provider at the discretion of the CONTRACTOR may review medical records.

GC 8.3 First Aid Facilities

Where CONTRACTOR or OWNER have first aid facilities at the Jobsite they may, at their option, make available their first aid facilities to treat employees of SUBCONTRACTOR who may be injured or become ill while performing the Work under this subcontract. If first aid facilities and/or services are made available to SUBCONTRACTOR'S employees, then, in consideration for the use of such facilities and the receipt of such services, SUBCONTRACTOR hereby agrees:

- (a) To release, defend, indemnify, and hold harmless CONTRACTOR, OWNER, and their authorized representatives, successors or assigns, and all of their officers and employees from and against any and all claims, demands, liabilities, including attorney's fees, arising from the receipt of such services or the use of such facilities by SUBCONTRACTOR'S employees, except for claims and demands arising out of the sole active negligence of CONTRACTOR, OWNER, or any of their representatives.
- (b) Upon receipt of any notice from CONTRACTOR or OWNER of any such claim, demand, or liability being pursued against CONTRACTOR or OWNER, to not only undertake the defense of such claim, demand or liability, but also upon entry of judgment, to make any and all payments necessary thereunder.
- (c) If any of SUBCONTRACTOR'S employees require off-site medical services, including transportation thereto, SUBCONTRACTOR shall promptly pay for such services directly to the providers thereof.

GC 8.4 Notices

Any notices provided for hereunder shall be in writing and may be served either personally on the authorized representative of the receiving party at the Jobsite or by registered mail to the address of that party, as shown on the face of the Subcontract Agreement Form or as such address may have been changed by written notice.

GC 8.5 Changes

- 8.5.1 CONTRACTOR may, at any time, without notice to the sureties, by written Change Notice, unilaterally make any change in the Work within the general scope of this Subcontract, including, but not limited to, changes:
- (a) In the drawings, designs, or specifications.
 - (b) In the method, manner, or sequence of SUBCONTRACTOR Work.
 - (c) In OWNER or CONTRACTOR-furnished facilities, equipment, materials, services, or site(s).
 - (d) Directing acceleration or deceleration in the performance of the Work.
 - (e) Modifying the Subcontract Schedule or the Subcontract Milestones.

- 8.5.2 All other changes to this Subcontract outside the scope of work shall be by written Modification signed by both parties
- 8.5.3 If an emergency occurs that endangers life or property, CONTRACTOR may use oral orders to SUBCONTRACTOR for any work required by reason of such emergency. SUBCONTRACTOR shall commence and complete such emergency work, as directed by CONTRACTOR. Such orders will be confirmed by Change Notice..
- 8.5.4 If at any time SUBCONTRACTOR believes that acts or omissions of CONTRACTOR or OWNER constitute a change to the Work not covered by a Change Notice, SUBCONTRACTOR shall within ten (10) calendar days of discovery of such act or omission submit a written Change Notice Request explaining, in detail, the basis for the request. CONTRACTOR will either issue a Change Notice or deny the request in writing.
- 8.5.5 If any change under this clause directly or indirectly causes an increase or decrease in cost of, or the time required for, the performance of any part of the Work under this Subcontract, whether or not changed by any order, an equitable adjustment shall be made and the Subcontract modified accordingly. However, SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors for increased costs in connection with any changes or delays in the Work for claims arising in tort (including negligence), or in contract except as specifically provided in this Subcontract.
- 8.5.6 If the SUBCONTRACTOR intends to assert a claim for an equitable adjustment under this clause, it must, within (10) calendar days after receipt of a Change Notice provide written notification of such intent and within a further twenty (20) calendar days, pursuant to the Special Condition clause titled "PRICING ADJUSTMENTS," submit to CONTRACTOR a written proposal in sufficient detail to permit thorough analysis and negotiation.
- 8.5.7 To facilitate prompt resolution, Requests for Equitable Adjustments, require a full and complete submittal of factual causes, contractual bases, quantified impacts, documentary evidence, and proposed resolutions from the Subcontractor. Submittals should address the following:
- (a) A description of the work performed, delayed, or impacted.
 - (b) Quantified cost and schedule impacts.
 - (c) A description of the contractual bases for entitlement.
 - (d) A description of the requested relief.
- 8.5.8 Any delay by SUBCONTRACTOR in giving notice or presenting a proposal for adjustment under this clause shall be grounds for rejection of the claim if and to the extent CONTRACTOR or OWNER are prejudiced by such delay. In no case shall a claim by SUBCONTRACTOR be considered if asserted after final payment under this Subcontract.
- 8.5.9 Failure by CONTRACTOR and SUBCONTRACTOR to agree on any adjustment shall be a dispute within the meaning of the General Condition clause titled "DISPUTES." However, SUBCONTRACTOR shall proceed diligently with performance of the work, as changed, pending final resolution of any request for relief, dispute, claim appeal, or action arising under the Subcontract and comply with any decision of CONTRACTOR.

GC 8.6 Final Inspection and Acceptance

- 8.6.1 When SUBCONTRACTOR considers the Work, or any CONTRACTOR-identified independent portion of the Work, under this Subcontract to be complete and ready for acceptance, SUBCONTRACTOR shall notify CONTRACTOR in writing. CONTRACTOR, with SUBCONTRACTOR'S cooperation, will conduct such reviews, inspections, and tests as may be reasonably required to satisfy CONTRACTOR that the Work, or identified portion of the Work, conforms to all requirements of the Subcontract. If all or any part of the Work covered by SUBCONTRACTOR'S notice does not conform to Subcontract requirements, CONTRACTOR shall notify SUBCONTRACTOR of such nonconformance and

SUBCONTRACTOR shall take corrective action and then have the nonconforming work re-inspected until all Subcontract requirements are satisfied.

8.6.2 CONTRACTOR shall issue a Notice of Provisional Acceptance for individual portions that have been satisfactorily inspected, subject only to CONTRACTOR'S Final Acceptance of the Work as a whole.

8.6.3 CONTRACTOR'S written Notice of Final Acceptance of the Work under this Subcontract shall be final and conclusive, except with regard to latent defects, fraud, or such gross mistakes as amount to fraud, or with regard to CONTRACTOR'S and OWNER'S rights under the General Condition clause titled "WARRANTY."

GC 8.7 Emergency Situation

The OWNER or designee shall have sole discretion to determine when an emergency situation exists at the Hanford Site, except for the DOE Office of River Protection Project facilities, affecting site personnel, the public health, safety, the environment, or security. The Manager, Office of River Protection (ORP), or designee has the discretion to determine whether an emergency situation exists under other ORP contract areas of work that might affect RL workers. In the event that either the RL or ORP Manager or designee determines such an emergency exists, the RL Manager or designee will have the authority to direct any and all activities of the Subcontractor and lower tier subcontractors necessary to resolve the emergency situation. The RL Manager or designee may direct the activities of the Subcontractor and lower subcontractors throughout the duration of the emergency. The Subcontractor shall include this clause in all lower-tier subcontracts for work performed at the Hanford Site.

9.0 GENERAL SUBCONTRACT PROVISIONS

GC 9.1 Applicable Law

Irrespective of the place of performance, the provisions in this Order that adopt or adapt Federal Government Acquisition Regulations (FAR) shall be construed and interpreted according to the federal common law of government contracts as enunciated and applied by federal judicial bodies, boards of contracts appeals, and quasi-judicial agencies of the federal government. To the extent that the federal common law of government contracts is not dispositive, the laws of the State of Washington shall apply.

GC 9.2 Words and Phrases

9.2.1 Where the words "as shown," or words of like import are used in this Subcontract, reference is to the drawings listed in this Subcontract unless the context clearly indicates a different meaning. Where the words "required," "approved," "satisfactory," "determined," "acceptable" or words of like import are used in this Subcontract, action by CONTRACTOR is indicated unless the context clearly indicates otherwise, and all the Work shall be in accordance therewith.

9.2.2 A requirement that a SUBCONTRACTOR-furnished document is to be submitted for or subject to "Authorization to Proceed," "Approval," "Acceptance," "Review," "Comment," or any combinations of such words or words of like import shall mean unless the context clearly indicates otherwise, that SUBCONTRACTOR shall, before implementing the information in the document, submit the document, obtain resolution of any comments and authorization to proceed. Such review shall not mean that a complete check will be performed. Authorization to proceed shall not constitute acceptance or approval of design details, calculations, analyses, tests, construction methods, or materials developed or selected by SUBCONTRACTOR and shall not relieve SUBCONTRACTOR from full compliance with requirements of the Subcontract.

9.2.3 Such action, or failure to act, shall not relieve SUBCONTRACTOR of its contractual responsibilities for performance of this Subcontract. Wherever in this Subcontract it is provided that SUBCONTRACTOR shall perform certain Work "at its expense" or "without charge" or that certain Work "will not be paid for separately," such quoted words mean that SUBCONTRACTOR shall not be entitled to any additional compensation from CONTRACTOR for such Work, and the cost thereof shall, unless otherwise specified, be considered as included in the payment for other items of the Work.

GC 9.3 Taxes

- 9.3.1 SUBCONTRACTOR shall pay all taxes, levies, duties, and assessments of every nature in connection with the Work under this Subcontract and shall make any and all payroll deductions required by law, and hereby indemnifies and holds harmless CONTRACTOR and OWNER from any liability on account of any and all such taxes, levies, duties, assessments, and deductions.
- 9.3.2 CONTRACTOR recognizes that the tax classification established by Revised Code of Washington (RCW) 82.04.263 (currently taxed at the rate of 0.471 percent) may be applicable to the performance of all work under this Subcontract.
- 9.3.3 Subcontractor will include the above language related to Washington State B&O Tax in all sub-tier subcontracts and purchase orders.

GC 9.4 Backcharges

- 9.4.1 If, under the provisions of this Subcontract, SUBCONTRACTOR is notified by CONTRACTOR to correct defective or nonconforming Work, and SUBCONTRACTOR states or by its actions indicates that it is unable or unwilling to proceed with corrective action in a reasonable time, CONTRACTOR may, upon written notice, proceed to accomplish the redesign, repair, rework, or replacement of nonconforming Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred. Furthermore, if CONTRACTOR agrees to or is required to perform Work for SUBCONTRACTOR, such as cleanup, off-loading, or completion of incomplete Work, CONTRACTOR may, upon written notice, perform such Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred.
- 9.4.2 The cost of backcharge Work shall include:
 - (a) Incurred labor costs, including all payroll additives.
 - (b) Incurred net delivered material costs.
 - (c) Incurred lower-tier supplier and subcontractor costs directly related to performing the corrective action.
 - (d) Equipment and tool rentals at prevailing rates in the Jobsite area.
 - (e) A factor of sixty percent (60%) applied to the total of items (a) through (d) for CONTRACTOR'S overhead, supervision, and administrative costs.
- 9.4.3 The backcharge notice will request SUBCONTRACTOR'S approval for CONTRACTOR to proceed with the required Work. However, failure of SUBCONTRACTOR to grant such approval shall not impair CONTRACTOR'S right to proceed with Work under this or any other provision of this Subcontract.
- 9.4.4 CONTRACTOR shall separately invoice or deduct from payments otherwise due to SUBCONTRACTOR the costs, as provided herein. CONTRACTOR'S right to backcharge is in addition to any and all other rights and remedies provided in this Subcontract or by law. The performance of backcharge Work by CONTRACTOR shall not relieve SUBCONTRACTOR of any of its responsibilities under this Subcontract, including, but not limited to, express or implied warranties, specified standards for quality, contractual liabilities and indemnifications, and the Subcontract Schedule.

GC 9.5 Examination of SUBCONTRACTOR's Record's and Accounts

SUBCONTRACTOR shall maintain a separate and distinct set of accounts and records in accordance with the General Condition entitled "DEAR 970.5232-3, Accounts, Records and Inspections (DEC 2000)." Inspection, copying, auditing and retention of such records shall be in accordance with the

above General Condition and the General Condition entitled "DEAR 970.5204-3, Access To and Ownership of Records (DEC 2000)."

GC 9.6 Title to Materials Found

The title to water, soil, rock, gravel, sand, minerals, timber, and any other materials developed or obtained in the excavation or other operations of SUBCONTRACTOR or any of its lower-tier subcontractors and the right to use said materials or dispose of same is hereby expressly reserved by OWNER. Neither SUBCONTRACTOR, its lower-tier subcontractors, nor any of their representatives or employees shall have any right, title, or interest in said materials, nor shall they assert or make any claim thereto. SUBCONTRACTOR may, at the sole discretion of OWNER, be permitted, without charge, to use in the Work any such materials that meet the requirements of this Subcontract.

GC 9.7 Termination for Default

9.7.1 Notwithstanding any other provisions of this Subcontract, SUBCONTRACTOR shall be considered in default of its contractual obligations under this Subcontract if SUBCONTRACTOR:

- (a) Performs work that fails to conform to the requirements of this Subcontract.
- (b) Fails to make progress so as to endanger performance of this Subcontract.
- (c) Abandons or refuses to proceed with any of the Work, including modifications directed pursuant to the General Condition clause titled "CHANGES."
- (d) Fails to fulfill or comply with any of the terms of this Subcontract.
- (e) Engages in behavior that is dishonest, fraudulent, or constitutes a conflict of interest with SUBCONTRACTOR'S obligations under this Subcontract.
- (f) Becomes insolvent or makes a general assignment for the benefit of creditors or reasonable grounds for insecurity arise with respect to SUBCONTRACTOR'S performance.
- (g) Fails to correct an unsafe condition or noncompliance or demonstrates a persistent pattern of poor safety performance.

9.7.2 Upon the occurrence of any of the foregoing, CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the nature of the failure and of CONTRACTOR'S intention to terminate the Subcontract for default. If SUBCONTRACTOR does not cure such failure within seven (7) calendar days from receipt of notification, or sooner if safety to persons is involved, or fails to provide satisfactory evidence that such default will be corrected within a reasonable time, CONTRACTOR may, by written notice to SUBCONTRACTOR and without notice to SUBCONTRACTOR'S sureties, if any, terminate in whole or in part SUBCONTRACTOR'S right to proceed with the Work and CONTRACTOR may prosecute the Work to completion by contract or by any other method deemed expedient. CONTRACTOR may take possession of and utilize any data, designs, licenses, equipment, materials, plant, tools, and property of any kind furnished by SUBCONTRACTOR and necessary to complete the Work.

9.7.3 SUBCONTRACTOR and its sureties, if any, shall be liable for all costs in excess of the Subcontract price for such terminated work reasonably and necessarily incurred in the completion of the Work as scheduled, including cost of administration of any purchase order or subcontract awarded to others for completion.

9.7.4 Upon termination for default, SUBCONTRACTOR shall:

- (a) Immediately discontinue work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts to the extent that they relate to the performance of the terminated work.

- (b) Inventory, maintain, and turn over to the CONTRACTOR all data, designs, licenses, equipment, materials, plant, tools, and property furnished by SUBCONTRACTOR or provided by CONTRACTOR for performance of the terminated work.
- (c) Promptly obtain cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for performance of the terminated work or assign those agreements as directed by CONTRACTOR.
- (d) Cooperate with the CONTRACTOR in transfer of data, designs, licenses, and information and disposition of work in progress so as to mitigate damages.
- (e) Comply with other reasonable requests from CONTRACTOR regarding the terminated work.
- (f) Continue to perform in accordance with all of the terms and conditions of this Subcontract of such portion of the Work that is not terminated.

9.7.5 If, after termination pursuant to this clause, it is determined for any reason that SUBCONTRACTOR was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to the General Condition clause titled "TERMINATION FOR CONVENIENCE."

GC 9.8 Termination for Convenience

9.8.1 CONTRACTOR may, at its option, terminate for convenience any of the Work under this Subcontract in whole or, from time to time, in part, at any time by written notice to SUBCONTRACTOR. Such notice shall specify the extent to which the performance of the Work is terminated and the effective date of such termination. Upon receipt of such notice SUBCONTRACTOR shall:

- (a) Immediately discontinue the Work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts for materials, services, or facilities, other than as may be required for completion of such portion of the Work that is not terminated.
- (b) Promptly obtain assignment or cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for the performance of the terminated work or assign those agreements directed by CONTRACTOR.
- (c) Assist CONTRACTOR in the maintenance, protection, and disposition of work in progress, plant, tools, equipment, property, and materials acquired by SUBCONTRACTOR or furnished by CONTRACTOR under this Subcontract.
- (d) Complete performance of such portion of the Work that is not terminated.

9.8.2 Upon any such termination, SUBCONTRACTOR shall waive any claims for damages, including loss of anticipated profits; on account thereof, but as the sole right and remedy of SUBCONTRACTOR, CONTRACTOR shall pay in accordance with the following:

- (a) The subcontract price corresponding to the work performed in accordance with this Subcontract before such notice of termination.
- (b) All reasonable costs for work thereafter performed, as specified in such notice.
- (c) Reasonable administrative costs of settling and paying claims arising from terminating work under purchase orders or subcontracts.
- (d) Reasonable costs incurred in demobilization and the disposition of residual material, plant, and equipment.
- (e) A reasonable overhead and profit on items (a) through (d) of this clause.

9.8.3 SUBCONTRACTOR shall submit within thirty (30) calendar days after receipt of notice of termination, a written statement setting forth its proposal for an adjustment to the subcontract price to include only the incurred costs described in this clause. CONTRACTOR shall review, analyze, and verify such proposal, and negotiate an equitable adjustment, and the Subcontract shall be modified accordingly.

GC 9.9 Non-Waiver

Failure by CONTRACTOR to insist upon strict performance of any terms or conditions of this Subcontract, or failure or delay to exercise any rights or remedies provided herein or by law, or failure to properly notify SUBCONTRACTOR in the event of breach, or the acceptance of or payment for any goods or services hereunder, or the review or failure to review designs shall not release SUBCONTRACTOR from any of the warranties or obligations of this Subcontract and shall not be deemed a waiver of any right of CONTRACTOR or OWNER to insist upon strict performance hereof or any of its rights or remedies as to any prior or subsequent default hereunder, nor shall any termination of Work under this Subcontract by CONTRACTOR operate as a waiver of any of the terms hereof.

GC 9.10 Indemnity, Fines and Penalties

9.10.1 SUBCONTRACTOR hereby releases and shall indemnify, defend, and hold harmless CONTRACTOR, OWNER, and their subsidiaries and affiliates and the officers, agents, employees, successors and assigns and authorized representatives of all the foregoing from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs and expenses of whatsoever kind or nature, in connection with or incidental to the performance of this subcontract, whether arising before or after completion of the Work hereunder and in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part, or claimed to be caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of SUBCONTRACTOR, its lower-tier suppliers, subcontractors or of anyone acting under its direction or control or on its behalf in connection with or incidental to the performance of this Subcontract. SUBCONTRACTOR'S aforesaid release, indemnity, and hold harmless obligations, or portions or applications thereof, shall apply to the extent of its negligence or fault and to the fullest extent permitted by law.

9.10.2 The foregoing shall include, but is not limited to, indemnity for:

- (a) Property damage and injury to or death of any person, including employees of CONTRACTOR, OWNER or SUBCONTRACTOR.
- (b) The breach by SUBCONTRACTOR of any representation, warranty, covenant, or performance obligation of this subcontract.
- (c) Events which are directly or indirectly caused by or incident to the radioactive, toxic and/or hazardous properties of any substances.
- (d) Events which arise out of any state or federal statute relating to radioactive, toxic and/or hazardous properties, such as the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) or Resource Conservation and Recovery Act of 1976 (RCRA), and shall apply to any clean-up or response costs occasioned by the transport, treatment, storage or disposal by SUBCONTRACTOR or any third party of radioactive, toxic and/or hazardous properties.

9.10.3 SUBCONTRACTOR specifically waives any immunity provided against this indemnity by an industrial insurance or workers' compensation statute.

9.10.4 SUBCONTRACTOR is liable to CONTRACTOR for fines and penalties assessed by any governmental entity against CONTRACTOR or OWNER as a result of SUBCONTRACTOR'S performance or lack of performance. SUBCONTRACTOR shall indemnify and hold harmless CONTRACTOR and OWNER from and against any and all claims, demands, actions, causes of action, suits, damages, expenses, including attorney's fees, and liabilities whatsoever resulting from or arising in any manner on account of the assessment of said fines and penalties against CONTRACTOR or OWNER.

GC 9.11 Patent and Intellectual Property Indemnity

- 9.11.1 In addition to FAR 52.227-4, Patent Indemnity-Construction Contracts (APR 1984), SUBCONTRACTOR hereby indemnifies and shall defend and hold harmless CONTRACTOR, OWNER, and their representatives from and against any and all claims, actions, losses, damages, and expenses, including attorney's fees, arising from any claim, whether rightful or otherwise, that any concept, product, design, equipment, material, process, copyrighted material or confidential information, or any part thereof, furnished by SUBCONTRACTOR under this Subcontract constitutes an infringement of any patent or copyrighted material or a theft of trade secrets. If use of any part of such concept, product, design, equipment, material, process, copyrighted material or confidential information is limited or prohibited, SUBCONTRACTOR shall, at its sole expense, procure the necessary licenses to use the infringing or a modified by non-infringing concept, product, design, equipment, material, process, copyrighted material or confidential information or, with CONTRACTOR'S OR OWNER'S prior written approval, replace it with substantially equal but non-infringing concepts, products, designs, equipment, materials, processes, copyrighted material or confidential information; provided, however,
- (a) That any such substituted or modified concepts, products, designs, equipment, material, processes, copyrighted material, or confidential information shall meet all the requirements and be subject to all the provisions of this Subcontract.
 - (b) That such replacement or modification shall not modify or relieve SUBCONTRACTOR of its obligations under this Subcontract.
- 9.11.2 The foregoing obligation shall not apply to any concept, product, design, equipment, material, process, copyrighted material, or confidential information the detailed design of which (excluding rating and/or performance specifications) has been furnished in writing by CONTRACTOR or OWNER to SUBCONTRACTOR.

GC 9.12 Assignments and Subcontracts

- 9.12.1 Any assignment of this Subcontract or rights hereunder, in whole or part, without the prior written consent of CONTRACTOR shall be void, except that upon ten (10) calendar days written notice to CONTRACTOR, SUBCONTRACTOR may assign monies due or to become due under this Subcontract, provided that any assignment of monies shall be subject to proper set-offs in favor of CONTRACTOR and any deductions provided for in this Subcontract.
- 9.12.2 SUBCONTRACTOR shall not subcontract with any third party for the performance of all or any portion of the Work without the advance written approval of CONTRACTOR. Lower-tier subcontracts and purchase orders must include provisions to secure all rights and remedies of CONTRACTOR and OWNER provided under this Subcontract, and must impose upon the lower-tier supplier and subcontractor all of the general duties and obligations required to fulfill this Subcontract.
- 9.12.3 Copies of all purchase and subcontract agreements are to be provided to CONTRACTOR upon request. Pricing may be deleted unless the compensation to be paid thereunder is reimbursable under this Subcontract.
- 9.12.4 No assignment or subcontract will be approved that would relieve SUBCONTRACTOR or its sureties, if any, of their responsibilities under this Subcontract.

GC 9.13 Survival

The rights and obligations of the parties that by their nature survive termination or completion of this Subcontract, including, but not limited to, those set forth in the General Conditions titled "WARRANTY" and "INDEMNITY," shall remain in full force and effect.

GC 9.14 Disputes

- 9.14.1 SUBCONTRACTOR shall proceed diligently with performance of the Work, pending final resolution of any request for relief, dispute, claim, appeal, or action arising under the Subcontract, and comply with any decision of CONTRACTOR. SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors in tort (including negligence), or contract except as specifically provided in this Subcontract.
- 9.14.2 Any claim for an adjustment to the Subcontract price or time of performance which cannot be resolved by negotiation shall be considered a dispute within the meaning of this clause.
- 9.14.3 If for any reason SUBCONTRACTOR and CONTRACTOR are unable to resolve a claim for an adjustment, SUBCONTRACTOR or CONTRACTOR shall notify the other party in writing that a dispute exists and request or provide a final determination by CONTRACTOR. Any such request by SUBCONTRACTOR shall be clearly identified by reference to this clause and shall summarize the facts in dispute and SUBCONTRACTOR'S proposal for resolution.
- 9.14.4 If CONTRACTOR'S final determination is not accepted by SUBCONTRACTOR the matter shall, within thirty (30) calendar days, be referred to senior executives of the parties who shall have designated authority to settle the dispute. The parties shall promptly prepare and exchange memoranda stating the issues in dispute and their respective positions, summarizing the negotiations that have taken place and attaching relevant documents.
- 9.14.5 The senior executives will meet for negotiations at a mutually agreed time and place. If the matter has not been resolved within thirty (30) calendar days of the commencement of such negotiations, the parties agree to consider resolution of the dispute through some form of Alternative Dispute Resolution (ADR) process that is mutually acceptable to the parties.
- 9.14.6 Should the parties agree to pursue an ADR process, each party will be responsible for its own expenses incurred to resolve the dispute during the ADR process.
- 9.14.7 If the parties do not agree to an ADR process or are unable to resolve the dispute through ADR, either party shall then have the right to pursue any legal remedy.

GC 9.15 Nondisclosure

- 9.15.1 SUBCONTRACTOR agrees not to divulge to third parties, without the written consent of CONTRACTOR or OWNER, any information obtained from or through CONTRACTOR or OWNER in connection with the performance of this Subcontract unless:
- (a) The information is known to SUBCONTRACTOR before obtaining the same from CONTRACTOR or OWNER;
 - (b) The information is, at the time of disclosure by SUBCONTRACTOR, then in the public domain; or
 - (c) The information is obtained by SUBCONTRACTOR from a third party who did not receive same, directly or indirectly, from CONTRACTOR or OWNER and who has no obligation of secrecy with respect thereto.
- 9.15.2 SUBCONTRACTOR further agrees that it will not, without the prior written consent of CONTRACTOR or OWNER, disclose to any third party any information developed or obtained by SUBCONTRACTOR in the performance of this Subcontract except to the extent that such information falls within one of the categories described in (a), (b), or (c) above.
- 9.15.3 If so requested by CONTRACTOR or OWNER, SUBCONTRACTOR further agrees to require its employees to execute a nondisclosure agreement before performing any Work under this Subcontract.

GC 9.16 Procurement Integrity

- 9.16.1 The SUBCONTRACTOR warrants that it is familiar with and will comply with all the requirements of Section 27 of the Office of Federal Procurement Policy Act of 1988 (41 U.S.C. §423), as implemented in the Federal Acquisition Regulations (referred to in this clause as "the Act"), including, but not limited to (1) prohibitions on giving or offering future employment, money, or anything of value to a procurement official, (2) prohibitions on soliciting or obtaining from an agency, prior to award, any proprietary or source selection information regarding the procurement, and (3) limits on participation of former government employees and officials in negotiation and performance of government contracts. For a violation of the Act, the Government may reduce the fee or profit on the contract, terminate all or a portion of the contract for default, suspend or debar the contractor from future Federal Government work, impose fines or imprisonment, or pursue other legal remedies.
- 9.16.2 In addition to any other remedies provided by law or herein, the SUBCONTRACTOR agrees to indemnify and hold CONTRACTOR harmless to the full extent of any loss (including any reduction in fee or profit), damages, or expenses (including attorney's fees) if any of the SUBCONTRACTOR'S actions, acting alone or in concert with any other person or entity, cause the government to enforce the provisions of the Act or related regulations against CONTRACTOR.
- 9.16.3 The SUBCONTRACTOR agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all lower-tier subcontracts in amounts exceeding \$100,000.00.

GC 9.17 Rights in Data

When design and/or data is furnished under this Subcontract, FAR 52.227-14 applies.

GC 9.18 Continuity of Service

- 9.18.1 The SUBCONTRACTOR recognizes that the services performed under this Subcontract are vital to the OWNER and must be continued without interruption, and that, upon expiration of the Prime Contract between the OWNER and the CONTRACTOR, a successor, either the Government or another Contractor, may continue to require that the services be performed. The CONTRACTOR shall provide a sixty (60) day written notice to the SUBCONTRACTOR once the successor has been named. The SUBCONTRACTOR shall work with the OWNER and the CONTRACTOR to ensure an efficient transfer to the successor is made.
- 9.18.2 CONTRACTOR may assign this Subcontract to the OWNER or to such party as OWNER may designate to perform CONTRACTOR'S obligations hereunder. Upon receipt by SUBCONTRACTOR of written notice that the OWNER or a party so designated by the OWNER has accepted an assignment of this Subcontract, CONTRACTOR shall be relieved of all responsibility hereunder and SUBCONTRACTOR shall thereafter look solely to such assignee for performance of CONTRACTOR'S obligations.

GC 9.19 Government Flowdowns

The Federal Acquisition Regulation (FAR), the Department of Energy (DOE) FAR Supplement (DEAR) clauses, and the DOE Procurement Regulations incorporated herein shall have the same force and effect as if printed in full text. Upon request, CONTRACTOR will make their full text available. Wherever necessary to make the context of the FAR and DEAR clauses applicable to this Subcontract, the term "Contractor" shall mean "SUBCONTRACTOR," the term "Contract" shall mean this Subcontract, and the term "Government," Contracting Officer" and equivalent phrases shall mean the CONTRACTOR'S representative, except the terms "Government" and Contracting Officer" do not change: (1) in the phrases "Government Property," "Government-Furnished Property," and "Government-Owned Property"; (2) in the patent clauses incorporated herein; (3) when a right, act, authorization or obligation can be granted or performed only by the Government's duly authorized representative; (4) when title to property is to be transferred directly to the Government; (5) when access to proprietary financial information or other proprietary data is required except for authorized audit rights; and (6) where specifically modified herein.

9.19.1 Applicable to All Subcontracts

CLAUSE	TITLE
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)
52.223-3	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997) – ALT 1 (JUL 1995)
522.22	PRIVACY ACT NOTIFICATION (APR 1984)
52.224-2	PRIVACY ACT (APR 1984)
52.225-11	BUY AMERICAN ACT – CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS AND NORTH AMERICAN FREE TRADE AGREEMENT (JUN 1997)
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (DEC 2003)
52.227-4	PATENT INDEMNITY-CONSTRUCTION CONTRACTS (APR 1984)
52.242-13	BANKRUPTCY (JUL 1995)
52-244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS (JUL 2004)
952.203-70	WHISTLEBLOWER PROTECTION FOR CONTRACTOR EMPLOYEES (DEC 2000)
952.204-2	SECURITY (MAY 2002)
952.208-70	PRINTING (APR 1984)
952.217-70	ACQUISITION OF REAL PROPERTY (APR 1984)
952.227-82	RIGHTS TO PROPOSAL DATA (APR 1994)
970.5223-4	WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (DEC 2000)
970-5232-3	ACCOUNTS, RECORDS, AND INSPECTION (DEC 2000)
CRD M 442.1-1	DIFFERING PROFESSIONAL OPINIONS MANUAL FOR TECHNICAL ISSUES INVOLVING ENVIRONMENT, SAFETY AND HEALTH
CRD O 450.1A	ENVIRONMENTAL PROTECTION PROGRAM

9.19.2 Applicable to Subcontracts over \$2,000 Where the Davis-Bacon Act Applies

CLAUSE	TITLE
52.222-6	DAVIS-BACON ACT (FEB 1995)
52.222-7	WITHHOLDING OF FUNDS (FEB 1988)
52.222-8	PAYROLLS AND BASIC RECORDS (FEB 1988)
52.222-9	APPRENTICES AND TRAINEES (FEB 1988)
52.222-10	COMPLIANCE WITH COPELAND REGULATIONS (FEB 1988)
52.222-11	SUBCONTRACTS LABOR STANDARDS (FEB 1988)
52.222-12	CONTRACT TERMINATION-DEBARMENT (FEB 1988)
52.222-13	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
52.222-14	DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
52.222-15	CERTIFICATION OF ELIGIBILITY (FEB 1988)
52.222-16	APPROVAL OF WAGE RATES (FEB 1988)
53.222(e)	APPLICATION OF LABOR LAWS TO GOVERNMENT ACQUISITIONS
952.222-39	NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES (DEC 2004)
970.5223-1	INTEGRATION OF ENVIRONMENT, SAFETY AND HEALTH INTO WORK PLANNING AND EXECUTION

9.19.3 Applicable to Subcontracts over \$2,500

CLAUSE	TITLE
52.222-3	CONVICT LABOR (JUN 2003)

9.19.4 Applicable to Subcontracts over \$2,500 Where the Service Contract Act Applies

CLAUSE	TITLE
52.222-41	SERVICE CONTRACT ACT OF 1965, AS AMENDED (MAY 1989)

9.19.5 Applicable to Subcontracts over \$10,000

CLAUSE	TITLE
52.222-21	PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)
52.222-26	EQUAL OPPORTUNITY (APR 2002)
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

9.19.6 Applicable to Subcontracts over \$25,000

CLAUSE	TITLE
52.222-35	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)

9.19.7 Applicable to Subcontracts over \$100,000

CLAUSE	TITLE	INSTRUCTIONS
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)	
52.203-7	ANTI-KICKBACK PROCEDURES (JUL 1995)	Add to (c)(2): "Seller shall notify Buyer when such action has been taken." In the first sentence of (c)(4) 'the Contract Officer may...' is replaced by 'after the Contracting Officer has effected an offset at the prime contract level or has directed Buyer to withhold any sum from the Seller, Buyer shall...'
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)	
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 2003)	
52.215-2	AUDIT AND RECORDS - NEGOTIATIONS (JUNE 1999)	
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2001)	
52.222-4	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT - OVERTIME COMPENSATION (SEP 2000)	
52.223-14	TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)	
52.227-1	AUTHORIZATION AND CONSENT (JUL 1995)	

CLAUSE	TITLE	INSTRUCTIONS
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)	

9.19.8 Applicable to Subcontracts over \$500,000

CLAUSE	TITLE
52.230-6	ADMINISTRATION OF COST ACCOUNTING STANDARDS (NOV 1999) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)
952.226-74	DISPLACED EMPLOYEE HIRING PREFERENCE (JUNE 1997)
970.5226-2	WORKFORCE RESTRUCTURING UNDER SECTION 3161 OF THE NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1993 (DEC 2000)
52.219-9	SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) ALTERNATIVE II (OCT 2001) Threshold for Construction is \$1,000,000. (Does not apply to small business or those instances where subcontracting opportunities are not available at the time of award.)

9.19.9 Applicable to Subcontracts over \$550,000

CLAUSE	TITLE
52.215-10	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)
52.215-11	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-13	SUBCONTRACTOR COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-15	PENSION ADJUSTMENTS AND ASSET REVERSIONS (JAN 2004)
52.215-18	REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)
52.215-19	NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

9.19.10 Applicable to Subcontracts over \$650,000

CLAUSE	TITLE
52.230-2	COST ACCOUNTING STANDARDS (APR 1998) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)

9.19.11 Applicable to Subcontracts Where Nuclear Hazards May Exist

CLAUSE	TITLE
952.223-75	PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)
952.250-70	NUCLEAR HAZARDS INDEMNITY AGREEMENT (OCT 2005)

9.19.12 Applicable to Subcontracts Where Government Property is Provided

CLAUSE	TITLE
52.244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS) (MAY 2004)
52.244-1	PROPERTY RECORDS (APR 1984) (Only applicable when WCH maintains the official property records.)
52.245-25	LIMITATION OF LIABILITY – SERVICES (FEB 1997)

CLAUSE	TITLE
952-244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-MATERIAL, OR LABOR-HOUR CONTRACTS)

9.19.13 Applicable to Subcontracts Where Technical Data or Computer Software will be Produced, Furnished or Acquired

CLAUSE	TITLE
52.227-14	RIGHTS IN DATA GENERAL (JUNE 1987) ALTERNATIVE V (JUNE 1987) AS MODIFIED PURSUANT TO DEAR 927.409 (a)

9.19.14 Applicable to Cost Reimbursement Subcontracts

CLAUSE	TITLE	INSTRUCTIONS
52.216-7	ALLOWABLE COST AND PAYMENT (DEC 2002)	(a) (3) 30 days
52.216-8	FIXED FEE (MAR 1997)	
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)	
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)	
52.244-2	SUBCONTRACTS (AUG 1998) – ALTERNATE II (AUG 1998)	
952.216-7	ALLOWABLE COST AND PAYMENT (JAN 1997) – ALTERNATE II	
952.251-70	CONTRACTOR EMPLOYEE TRAVEL DISCOUNTS (JUNE 1995)	
970.5204-3	ACCESS TO AND OWNERSHIP OF RECORDS (DEC 2000)	(b)(1) through (b)(5) are Subcontractor-owned records.

9.19.15 Applicable to Time and Material Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002)
52.24215	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)

9.19.16 Applicable to Labor-Hour Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002) ALTERNATE II (FEB 2002)
52.242-15	STOP-WORK ORDER (AUG 1989) - ALTERNATE I (APR 1984)

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EXHIBIT "B"

SPECIAL CONDITIONS

CONSTRUCTION SUBCONTRACTS

**ERDF SUPER CELLS 9 & 10 CONSTRUCTION QUALITY
ASSURANCE (CQA)**

SUBCONTRACT NUMBER S013213A00

**EXHIBIT B
SPECIAL CONDITIONS
CONSTRUCTION SUBCONTRACT**

WASHINGTON CLOSURE HANFORD LLC

TABLE OF CONTENTS

SC	Title	Page No.
1.0	SCOPE	1
2.0	DEFINITIONS	1
3.0	TERMS OF PAYMENT	1
SC 3.1	RESERVED	1
SC 3.2	RESERVED	1
SC 3.3	MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK	1
SC 3.4	EXPENDITURE NOTIFICATION.....	4
SC 3.5	PRICING ADJUSTMENTS	5
4.0	THE SUBCONTRACTOR.....	7
SC 4.1	POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	7
SC 4.2	Reserved	7
SC 4.3	SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES	7
SC 4.4	COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK	10
SC 4.5	SUBCONTRACT SCHEDULE.....	12
SC 4.6	Reserved	14
SC 4.7	SECURITY AND HAZARD COMMUNICATION PROGRAMS.....	14
SC 4.8	Reserved	14
SC 4.9	SUBCONTRACTOR KEY PERSONNEL	15
SC 4.10	RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE.....	15
SC 4.11	Reserved	16
5.0	THE CONTRACTOR	16
SC 5.1	CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS	16
SC 5.2	CONTRACTOR-FURNISHED UTILITIES AND SERVICES	16
SC 5.3	CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT	17
SC 5.4	CONTRACTOR-FURNISHED PERMITS	18
SC 5.5	AUTHORITY OF PERSONNEL.....	18
SC 5.6	DISPOSITION OF CONTAMINATED MATERIAL	20
6.0	GENERAL SUBCONTRACT PROVISIONS	19
SC 6.1	WORK HOURS AND FACILITY CLOSURE DAYS.....	19
SC 6.2	WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL.....	20
SC 6.3	SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION.....	20
SC 6.4	INCREMENTAL FUNDING OF SUBCONTRACT	20
SC 6.5	TECHNICAL DIRECTION	22
SC 6.6	TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY).....	23
SC 6.7	INTEGRATED WORK CONTROL PROGRAM	25
SC 6.8	SAFETY INCENTIVE.....	25

1.0 SCOPE

This Exhibit B provides Special Terms and Conditions that apply specifically to this Subcontract and SUBCONTRACTOR providing construction technical services to Washington Closure Hanford LLC.

2.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH) and all of its authorized representatives acting in their professional capacities in performance of OWNER'S Contract No. DE-AC06-05RL14655. To the extent that the CONTRACTOR is not the ultimate user of the services required herein, all rights, benefits and remedies conferred by Subcontractor shall also accrue and be available to and are for the express benefit of the OWNER for which the Services are required.

"JOBSITE" and "SITE" means the location(s) at which or for which the Services will be provided.

"OWNER" means the United States Department of Energy (DOE) / United States Government.

"WORK" and "SERVICES" means all technical and professional Services and responsibilities to be performed by the SUBCONTRACTOR as specified, stated, indicated or implied in the Master Agreement Subcontract or Job Order, including the furnishing and supervision of all technical personnel and the supply of all equipment, materials and supplies necessary or required to perform the Master Agreement Subcontract or Job Order.

"SUBCONTRACTOR" means the company, corporation, partnership, individual or other entity to which the Master Agreement Subcontract or Job Order is issued, its authorized representatives, successors, and permitted assigns.

"PROGRAM" means the performance of the requirements of Contract No. DE-AC06-05RL14655

"SUBCONTRACT TECHNICAL REPRESENTATIVE" is designated by the CONTRACTOR as the individual responsible for the technical aspects of the performance of the Subcontract.

"SUBCONTRACT SPECIALIST" is designated by the CONTRACTOR as the individual responsible for administering the Subcontract terms and conditions and who acts as CONTRACTOR's authorized representative.

3.0 TERMS OF PAYMENT

SC 3.1 RESERVED

SC 3.2 RESERVED

SC 3.3 MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK

- 3.3.1 For the purpose of arriving at agreement on the basis for progress payments for items bid as lump sum, SUBCONTRACTOR shall, within fifteen (15) calendar days after award, submit a proposed breakdown of values of the various elements of the Work comprising the lump sum item. Such submittal shall also include a proposed schedule of monthly progress payments. The proposed breakdown and payment schedule shall be correlated with the schedule and reports required by the Special Condition entitled "SUBCONTRACT SCHEDULE". Such breakdown and payment schedule shall be subject to CONTRACTOR'S approval.

- 3.3.2 Estimates shall be prepared by SUBCONTRACTOR and submitted in writing for CONTRACTOR'S approval on or about the end of each month covering the amount and value of Work satisfactorily performed by SUBCONTRACTOR up to the date of such estimate. Such estimate may be made by strict measurement, or by estimate, or partly by one method and partly by another. Estimates shall be based on cumulative total quantities of Work performed. Estimates may include materials or equipment not incorporated into the Work. The quantity of Work to be paid for under any item for which a unit price is fixed in the Subcontract shall be the amount or number, approved by CONTRACTOR, of units of Work satisfactorily completed in accordance with this Subcontract and computed in accordance with applicable measurement for payment provisions of this Subcontract.
- 3.3.3 SUBCONTRACTOR shall make all surveys necessary for determining quantities of Work to be paid for under this Subcontract. Copies of field notes, computations, and other records made by SUBCONTRACTOR to determine quantities shall be furnished to CONTRACTOR upon request. SUBCONTRACTOR shall notify CONTRACTOR before such surveys are made.
- 3.3.4 CONTRACTOR, at its discretion, may arrange to have its representative witness and verify surveys made by SUBCONTRACTOR for determining quantities of Work to be paid for under this Subcontract. Measurements and computations shall be made by such methods as CONTRACTOR may consider appropriate for the class of Work measured, and the estimate of quantities of Work completed shall be compatible with the reporting requirements required hereunder by the Special Condition titled "SUBCONTRACT SCHEDULE". The dividing limits, lines, or planes between adjacent items or classes of excavation, concrete, or other types of Work where not definitely indicated on the drawings or in the specifications shall be as determined by CONTRACTOR.
- 3.3.5 Review by CONTRACTOR of SUBCONTRACTOR'S estimate of the amount and value of the Work performed will be within ten (10) calendar days of its receipt and a copy of the estimate as approved returned to SUBCONTRACTOR. SUBCONTRACTOR shall prepare and submit to CONTRACTOR an invoice in accordance with the estimate as approved. SUBCONTRACTOR shall certify in each application for payment that there are no known outstanding mechanic's or material-men's liens and that all due and payable bills have been paid or are included in the application for payment. Such certification shall be on the CONTRACTOR furnished "Request for Payment (Construction Subcontracts)" form that may be down-loaded from www.wch-icc.com. In addition, an Electronic Funds Transfer (EFT) form is provided to allow payments to be forwarded to the SUBCONTRACTOR'S bank account electronically. The EFT form will need to be completed by the CONTRACTOR and the CONTRACTOR'S bank. The bank needs to return the form to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attn: Accounts Payable

- 3.3.6 Reserved
- 3.3.7 CONTRACTOR may, as a condition precedent to any such payment to SUBCONTRACTOR, require SUBCONTRACTOR to submit complete waivers and releases of all claims of any person, firm, or corporation in connection with or in any way related to the performance of this Subcontract. Upon request, SUBCONTRACTOR shall also furnish acceptable evidence that such claims have been satisfied.
- 3.3.8 SUBCONTRACTOR shall submit, as required by CONTRACTOR, on a monthly basis, an accurate current and complete list of open purchase orders and subcontracts which include contact information (name and telephone number). CONTRACTOR reserves the right to use the contact information to verify prompt payment by SUBCONTRACTOR.

3.3.9 Any amounts otherwise payable under this Subcontract may be withheld, in whole or in part, if:

- (a) Any claims are filed against SUBCONTRACTOR by CONTRACTOR, OWNER or third parties, or if reasonable evidence indicates the probability of filing any such claims; or
- (b) SUBCONTRACTOR is in default of any Subcontract condition including, without limitation, the schedule, quality, and safety requirements; or
- (c) There is reasonable doubt that this Subcontract can be completed within the time specified or for the balance then unpaid; or
- (d) SUBCONTRACTOR has not submitted:
 - 1. Schedules and progress reports, as defined in the Special Condition titled "SUBCONTRACT SCHEDULE",
 - 2. Property insurance certificates, or not provided proper coverage or proof thereof,
 - 3. Its safety, security, and fire prevention plans, or
 - 4. Waivers and Releases or Waivers and Releases submitted with invalid information.
 - 5. Certified copies of payroll records required that are up to date to within two (2) weeks of the date SUBCONTRACTOR submits any invoice for payment.

3.3.10 CONTRACTOR will pay such withheld payments if SUBCONTRACTOR:

- (a) Pays, satisfies, or discharges any claim of CONTRACTOR, OWNER, or third parties against SUBCONTRACTOR arising out of or in any way connected with this Subcontract; or
- (b) Cures all defaults in the performance of this Subcontract.

3.3.11 If claims filed against SUBCONTRACTOR connected with performance under this SUBCONTRACT are not promptly removed by SUBCONTRACTOR after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may remove such claims and deduct all costs in connection with such removal from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. If the amount of such withheld payment or other monies due SUBCONTRACTOR is insufficient to meet such costs, or if any claim against SUBCONTRACTOR is discharged by CONTRACTOR after final payment is made, SUBCONTRACTOR shall promptly pay CONTRACTOR all costs incurred thereby, regardless of when such claim arose or whether such claim imposed a lien upon the Project or the real property upon which the Project is situated.

3.3.12 If CONTRACTOR is notified that SUBCONTRACTOR has failed to pay valid invoice submitted by sub-tier supplier or subcontractor in accordance with the payment terms of a valid sub-tier subcontract or purchase order for expenditures made under the scope of work of the SUBCONTRACT, SUBCONTRACTOR shall promptly pay such invoice. If invoices are not promptly paid by SUBCONTRACTOR within seven (7) days after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may pay such invoices directly to the sub-tier supplier or subcontractor and deduct all costs in connection with such payment from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. CONTRACTOR also reserves the right to require SUBCONTRACTOR to submit separate invoices for any or all sub-tier subcontractors or suppliers and to make payment to the sub-tier supplier or subcontractor on behalf of SUBCONTRACTOR.

- 3.3.13 If a lien is filed, SUBCONTRACTOR shall remove the lien, or see that it is removed or shall furnish a bond for the full amount thereof within seven (7) calendar days of notice by CONTRACTOR. SUBCONTRACTOR shall obtain for itself legally effective waivers of lien and furnish same to CONTRACTOR with each application for payment. Failure to comply with the foregoing requirements shall constitute grounds for termination of this Subcontract in accordance with the General Condition titled, 'TERMINATION FOR DEFAULT'.
- 3.3.14 Upon receipt by SUBCONTRACTOR of CONTRACTOR'S written notice of Final Acceptance of the Work under this Subcontract, SUBCONTRACTOR shall prepare an estimate in writing for CONTRACTOR'S approval of the amount and value of all Work satisfactorily completed under this Subcontract. Upon CONTRACTOR'S approval of such estimate, SUBCONTRACTOR shall prepare and submit its final invoice in accordance with the approved estimate. Unless otherwise specified by applicable law, CONTRACTOR shall, within sixty (60) calendar days following Final Acceptance and after submittal of such invoice, pay to SUBCONTRACTOR the amount then remaining due, provided that, SUBCONTRACTOR shall have furnished CONTRACTOR and OWNER for itself, its subcontractors, immediate and remote, and all material suppliers, vendors, laborers, and other parties acting through or under it, waivers and releases of all claims against CONTRACTOR or OWNER arising under or by virtue of this Subcontract, except such claims, if any, as may with the consent of CONTRACTOR and OWNER be specifically excepted by SUBCONTRACTOR from the operation of the release in stated amounts to be set forth therein.
- 3.3.15 No payments of invoices or portions thereof shall at any time constitute approval or acceptance of Work under this Subcontract, nor be considered to be a waiver by CONTRACTOR or OWNER of any of the terms of this Subcontract. However, title to all material and equipment for which payment has been made, whether or not the same has been incorporated in the Work, and title to all completed Work whether paid for or not, shall vest in CONTRACTOR, or OWNER as the case may be, and in any case shall not be part of SUBCONTRACTOR'S property or estate in the event SUBCONTRACTOR is adjudged bankrupt or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of SUBCONTRACTOR'S insolvency.
- 3.3.16 Invoices for monthly progress payments and final payment should be signed and submitted along with a completed and signed "Request for Payment (Construction Subcontracts)" form in one (1) original copy to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Accounts Payable
Reference: Subcontract Number: **S013213A00**

SC 3.4 EXPENDITURE NOTIFICATION

- 3.4.1 SUBCONTRACTOR shall furnish to the address below the best estimate of the total billable cost (invoiced and invoiceable) from Award of the Subcontract through the current calendar month end. This information must be submitted in writing (facsimile acceptable) no later than the 15th of each month.

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Subcontract Specialist
Dana Looney (509) 372-9499
Fax: (509) 372-9049.

- 3.4.2 For Work performed on a unit-rate basis, SUBCONTRACTOR shall notify the CONTRACTOR'S Subcontract Specialist in writing when SUBCONTRACTOR expects that in the next sixty (60) calendar days billable charges, when added to all previously billed charges, will exceed seventy-five percent (75%) of the estimated Subcontract value shown in Exhibit "C". Upon expending seventy-five percent (75%) of the estimated Subcontract value, SUBCONTRACTOR shall provide the CONTRACTOR'S authorized representative with weekly written summaries of billable charges, inclusive of previously billed charges.
- 3.4.3 The CONTRACTOR is not obligated to reimburse the SUBCONTRACTOR for billable charges in excess of the estimated Subcontract value, as modified. The SUBCONTRACTOR is not obligated to continue performance under this Subcontract once billable charges reach one hundred percent (100%) of the estimated Subcontract value, as modified.

SC 3.5 PRICING ADJUSTMENTS

When costs are a factor in any determination of a Subcontract adjustment pursuant to the General Condition titled, "CHANGES", or any other provision of this Subcontract unless excluded therein, such direct and indirect costs, upward or downward, for labor, equipment, and material necessary to perform the Work of the Change shall be determined in accordance with the following:

- 3.5.1 Determination of direct labor hours for changes involving added or deleted work shall be as follows:
- (a) Direct labor hours necessary to perform the Work or the Change shall be established by applying standards from the most recent edition of *Building Construction Cost Data* (Means), published by R. S. Means Company, Inc.; or other CONTRACTOR-approved data-base, as may have been previously developed by SUBCONTRACTOR.
 - (b) In addition to direct payroll costs, direct labor costs shall include payroll taxes and insurance, vacation allowance, subsistence, travel allowance, overtime premium and any other payroll additives required to be paid by SUBCONTRACTOR by law or labor agreement(s) (e.g., Department of Labor Wage Determination, bargaining agreements such as the Hanford Site Stabilization Agreement, etc.).
 - (c) Charges for labor furnished and used by SUBCONTRACTOR shall include all manual classifications up to and including foremen. Labor rates used to calculate the costs shall be those rates in effect during accomplishment of the change. Charges shall not be included for superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics. These charges will be included in the indirect rate as set forth below.
- 3.5.2 Determination of direct costs of equipment for changes involving added or deleted work shall be as follows:
- (a) Allowable equipment costs of in-use or stand-by SUBCONTRACTOR-owned equipment will be computed by utilizing eighty percent (80%) of the rates set forth in the most current *Rental Rate Blue Book for Construction Equipment* (hereinafter referred to as the Blue Book), found at www.equipmentwatch.com, as adjusted for age of equipment in Region "F" provided such rates exclude unallowable or unacceptable costs in accordance with FAR 31.105. Hourly rates will be developed by using monthly rates divided by 166.7 hours based on a 4 day/10 hour per day work schedule...
 - 1. In-use or operating equipment rates will be developed by calculating the depreciation, major overhaul, and cost of facilities capital (CFC) portion of the Blue

Book rates. Blue Book indirect costs will not be allowed (they should be included as indirect rates as set forth below). The estimated operating cost per hour for consumables, including, but not limited to, maintenance labor and parts, fuel, oil, filters, lubricants, and tires will be allowed.

2. Stand-by equipment rates will be developed by calculating the CFC portion and one-half the depreciation portion of the Blue Book rate element table allowance. Blue Book indirect costs and major overhaul costs will not be allowed. The estimated operating cost per hour for consumables, including but not necessarily limited to, maintenance labor and parts; fuel, oil, filters, lubricants, and tires can not be included.

- (b) Equipment costs of in-use or stand-by SUBCONTRACTOR-rented equipment shall be computed as follows: CONTRACTOR shall develop "market rates" commensurate with rates from equipment rental firms for similar equipment within the area. Should SUBCONTRACTOR-proposed rates not be comparative, CONTRACTOR reserves the right to delete unreasonable charges.
- (c) When the equipment is operated infrequent and such equipment need not remain at the site of the Work continuously, as determined by the CONTRACTOR, charges shall be limited to actual hours of use. Equipment not operating, but retained at the jobsite at CONTRACTOR'S direction, shall be charged at the standby rate.

3.5.3 Direct costs of materials for changes involving added or deleted work shall be determined in the following ways:

- (a) From published supplier pricing data or written quotes from suppliers on specific items where published pricing data is not generally available (invoices from suppliers are acceptable); or
- (b) From standards published in Means, or other CONTRACTOR-approved data previously developed by SUBCONTRACTOR if information identified in paragraph (a) above is not available.

3.5.4 When pricing adjustments, the following are considered to be included as indirect costs, and as such may not be considered, and will not be compensated, as direct costs. Jobsite office expenses, incidental job burdens, small tools, general office overhead allocation, and costs for estimating the price of changed work.

3.5.5 The following shall apply to determine the indirect cost portion of Subcontract Price adjustments. CONTRACTOR recognizes Washington State business and occupation (B&O) tax rate of RCW 82.04.263 (currently 0.471 percent) as applicable to price adjustments to this Subcontract. Paragraphs (a), (b), and (c) below will apply when the adjustment does not meet the criteria for submittal of Certified Cost and Pricing data. **It must be emphasized that indirect rates in the paragraph (b) and (c) below are maximum rates and CONTRACTOR reserves the right to negotiate the indirect expense rates within the ceiling limitations.**

- (a) SUBCONTRACTOR'S and lower-tier subcontractor's overhead and profit shall be considered to include the following: insurance cost; small tools having a purchase price of \$500.00 or less; incidental job burdens; general home office expenses commonly known as G&A; labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics, as well as any other items specified for Overhead and Operations in Exhibit C. Unless otherwise stated, no separate allowance will be made and costs of premium adjustments, consequent upon changes ordered, for Payment and Performance Bonds (allowable for SUBCONTRACTOR only).

Note labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics are included in overhead & profit when the change notice occurs in the timeframe of the subcontract baseline schedule. If the change notice takes place outside the baseline schedule (i.e. added scope) then direct labor charges for these types of personnel are allowed.

- (b) Overhead and Profit allowance for SUBCONTRACTOR or lower-tier subcontractors on work performed by lower-tier subcontractors shall be calculated as follows: a maximum mark-up of ten percent (10%) shall be applied to the aggregate of sub-tier subcontractor charges less than or equal to \$25,000; a maximum mark-up of seven and one-half percent (7 ½%) shall be applied to the aggregate of sub-tier subcontractor charges greater than \$25,000 but less than or equal to \$650,000; a maximum mark-up of five percent (5%) or \$100,000, whichever is less shall be applied to the aggregate of sub-tier subcontractor charges greater than \$650,000.
- (c) For parties performing the Work, overhead and profit on changes shall be calculated not to exceed the following: ten percent (10%) overhead and ten percent (10%) profit on total direct costs up to \$25,000; seven and one-half percent (7 ½%) overhead and seven and one-half percent (7 ½%) profit on total direct costs over \$25,000.00, but less than \$650,000; five percent (5%) of total direct costs or \$100,000 whichever is less, for overhead and profit combined on total direct costs over \$650,000.
- (d) Overhead and profit shall be calculated utilizing the net increase in price of the change after deductions have been taken.
- (e) Credit for overhead and profit shall be included as part of the downward adjustment for a deductive change.

3.5.6 Any change in excess of \$650,000 will require cost and pricing data as part of the proposal for the change.

4.0 THE SUBCONTRACTOR

SC 4.1 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

- 4.1.1 Within ten (10) working days of Subcontract execution and prior to commencement of any Work, SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.
- 4.1.2 Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the Work.

SC 4.2 RESERVED

SC 4.3 SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES

- 4.3.1 SUBCONTRACTOR shall submit drawings, data, samples, and other submittals in accordance with Exhibit "I", "Subcontractor Submittal Requirements Summary," of this Subcontract.

CONTRACTOR will require a fourteen (14) calendar day review period for drawings, data, samples, and other submittals.

4.3.2 Review and permission to proceed by CONTRACTOR, as stated in this Special Condition, does not constitute acceptance or approval of design details, calculations, analyses, test methods, certificates, or materials developed or selected by SUBCONTRACTOR and does not relieve SUBCONTRACTOR from full compliance with contractual obligations. Drawing categories and their associated requirements include, but are not limited to, the following:

4.3.2.1 Issued for Construction (IFC) Drawings may be required for:

- Fabrication of SUBCONTRACTOR-furnished equipment,
- Installing SUBCONTRACTOR-furnished material or equipment,
- Planning and performance of the Work under this Subcontract
- Installing energized utility systems.

IFC drawings shall be prepared by the SUBCONTRACTOR in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." The drawings shall be submitted by and at the expense of SUBCONTRACTOR before fabrication, installation, or performance is commenced, allowing at least fourteen (14) calendar days for review by CONTRACTOR unless otherwise shown on the Subcontract Schedule. IFC drawings submitted by the SUBCONTRACTOR and reviewed by CONTRACTOR shall form a part of this Subcontract. Such drawings shall include, but not be limited to, matchmarks, erection diagrams, and other details, such as field connections for proper installation, erection of the equipment, and performance of the Work.

Drawings submitted by SUBCONTRACTOR shall be certified by SUBCONTRACTOR to be correct, shall show the Subcontract number, and shall be furnished in accordance with the Subcontract Submittal Requirements Summary (SSRS) form(s).

Design changes to the IFC drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.2 Samples:

Samples, if required, shall be submitted by and at the expense of SUBCONTRACTOR. Such submittals shall be made not less than thirty (30) calendar days before the time that the materials represented by such samples are needed for incorporation into the Work. Samples shall be subject to review and materials represented by such samples shall not be manufactured, delivered to the Jobsite, or incorporated into the Work without such review.

Each sample shall bear a label showing SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, brand name, model number, supplier's name, and reference to the appropriate drawing number, technical specification section and paragraph number, as applicable.

Samples that have been reviewed may, at CONTRACTOR'S option, be returned to SUBCONTRACTOR for incorporation into the Work.

4.3.2.3 Data and Certificates:

Four (4) copies of each required certificate shall be submitted by and at the expense of SUBCONTRACTOR. Such submittal shall be made not less than thirty (30) calendar days before the time that the materials represented by such certificates are needed for incorporation into the work. Certificates shall be subject to review, and material represented by such certificates shall not be fabricated, delivered to the jobsite, or incorporated into the Work without such review.

Certificates shall clearly identify the material being certified and shall include, but not be limited to, providing the following information: SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, and reference to the appropriate drawing, technical specification selection and paragraph number, as applicable.

4.3.2.4 Working Drawings and Design Changes:

During construction, the SUBCONTRACTOR shall keep an up-to-date set of working drawings on the jobsite as an accurate record of deviations between Work as shown on the IFC drawings and Work as installed. These drawings shall be available to CONTRACTOR and OWNER for inspection. The working drawings, including any initial as-built drawings, shall be available for inspection at the SUBCONTRACTOR's field office at the jobsite.

Design changes to the IFC drawings, including the redlining process, shall be made in accordance with the Technical Specification 000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.5 As-Built Drawings:

The SUBCONTRACTOR shall provide the as-built information submittals as described below and as detailed in Exhibit I.

4.3.2.5.1 Required Submittals. The SUBCONTRACTOR shall, at its expense, furnish to the CONTRACTOR the following submittals:

- Initial as-built drawings for energized utility systems. Drawings shall show the energized utility system configuration at the time it was placed into service.
- Final as-built drawings for all IFC and initial as-built drawing.

The content, level of detail, accuracy of location and format of the as-built drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." Design change process for initial as-built and final as-built drawings shall be in accordance with Technical Specification 0000X-SP-X0001.

4.3.2.5.2 Submittal Schedule. SUBCONTRACTOR shall furnish the as-builts drawing submittals in accordance with the schedule below:

- Initial as-built drawing for electrical utility systems – Due not later than thirty (30) calendar days after final energization of the system.
- Initial as-built drawings for non-electrical utility systems – Due not later than thirty (30) calendar days after installation is complete. CONTRACTOR approval of the as-built submittal is required prior to using the non-electrical utility.
- Final as-built drawings for all work including energized utility systems due not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment.

4.3.2.6 As-Built Specifications:

SUBCONTRACTOR shall, at its expense and not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment, furnish to CONTRACTOR a complete set of marked-up, final as-built specifications with FINAL AS-BUILT clearly printed on the cover and associated electronic file. SUBCONTRACTOR shall accurately and neatly transfer all annotations from progress as-builts to final as-builts.

Deviations from specifications must be supported by Request for Information (RFI), Supplier Deviation Disposition Request (SDDR), or Design Change Notice (DCN).

4.3.2.7 Electronic Files:

As-built drawings submittals shall be prepared using acceptable and compatible software as determined by the CONTRACTOR. Submittal documents shall be delivered in the quantities as specified in Exhibit I and accompanied by an electronic media version.

4.3.2.7.1 Specifications: Textual material shall be converted to Microsoft Word and shall have a ".doc" extension.

4.3.2.7.2 Drawings: Design drawings shall be prepared by SUBCONTRACTOR in accordance with Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.8 Energized Systems:

Energized systems include, but are not limited to, the following:

- Electric Power and Control Systems (except telephone and computer systems)
- Pressurized piping systems
- Sanitary and process sewer systems

The SUBCONTRACTOR shall submit approved design and "as-built" information for energized systems (including detailed routing of above and below grade components) to the WCH Project Engineer as described above in the titled section "As-built Drawings." For electrical utility installations, the SUBCONTRACTOR shall have a "Hold Point" clearly stated in their work procedures/instructions requiring an NEC Inspection prior to final energizing of the affected system(s). The SUBCONTRACTOR shall have the current up-to-date working drawings for the system available for the NEC inspector's use. The final energization inspection shall only be undertaken by the NEC inspector if the working drawings are current and correctly show the configuration of the work to be inspected.

SC 4.4 COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK

4.4.1 SUBCONTRACTOR shall complete the Work under the Subcontract to meet the following Subcontract Milestones measured in calendar days from Notice to Proceed (NTP) with on-site Work of the Subcontract:

ERDF CELLS 9 & 10 CQA			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Complete Mobilization Submittals	Subcontract Award	30
2.	Submit Cell 9 Final Certification Report	Subcontract	4/01/2011

		Award	
3.	Submit Cell 10 Final Certification Report	Subcontract Award	9/01/2011
4.	Complete Demobilization	Subcontract Award	9/29/2011

CONTRACTOR will make available to the SUBCONTRACTOR the construction schedule provided by the ERDF Construction Subcontractor within 25 days after the award of ERDF Construction Subcontract. The SUBCONTRACTOR shall plan and ensure adequate resources are available in accordance with this schedule.

The following milestones were set by CONTRACTOR for the ERDF Construction Subcontract. SUBCONTRACTOR shall use these milestones only for bidding and resource planning purposes.

ERDF CELLS 9 & 10 CONSTRUCTION			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Submit Bonding and Insurance	Subcontract Award	10
2.	Complete Mobilization Submittals	Subcontract Award	30
3.	Cell 9 Excavation	Per S/C schedule	4/1/2010
4.	Admix Test Pad	Per S/C schedule	4/15/2010
5.	Complete Cell 10 North and South Embankments	Per S/C schedule	6/1/2010
6.	Cell 9 Admix Placement	Per S/C schedule	7/12/2010
7.	Cell 10 Excavation	Per S/C schedule	8/1/2010
8.	Remove Covers and Clean Existing Leachate Tanks	Per S/C schedule	8/1/2010
9.	New Covers on Existing Leachate Tanks	Per S/C schedule	10/1/2010
10.	Cell 9 Liner & Leachate Collection Systems	Per S/C schedule	10/1/2010
11.	Cell 10 Admix Placement (Admix Placement South of Sump and Admix Winter Protection)	Per S/C schedule	11/1/2010
12.	Cell 9 Operations Layer	Per S/C schedule	11/15/2010
13.	Revegetate Stockpiles	11/1/2010	12/31/2010
14.	Cell 9 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	12/1/2010
15.	Leachate Transmission Pipeline (pipeline, manholes, electrical)	Per S/C schedule	2/1/2011
16.	Leachate Tank No. 3	Per S/C schedule	2/1/2011
17.	Cell 9 Acceptance Testing	Per S/C schedule	3/1/2011
18.	Cell 10 Admix Placement (Admix Placement in Sump and North Slope & Remove Winter Protection)	Per S/C schedule	4/1/2011
19.	Cell 10 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	4/1/2011
20.	Cell 10 Liner & Leachate Collection Systems	Per S/C schedule	7/1/2011
21.	Cell 10 Operations Layer	Per S/C schedule	9/1/2011
22.	Cell 10 Acceptance Testing	Per S/C schedule	8/1/2011

23.	De-Mobilization	Per S/C schedule	9/29/2011
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4.4.2 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR to take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the Subcontract Milestones set forth above, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of work per week, expedited shipment(s) of equipment and materials, and an increase in the amount of construction plant and equipment, without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of work and rate of progress required by this Subcontract.

4.4.3 Noncompliance with CONTRACTOR'S instructions shall be grounds for CONTRACTOR'S determination that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate this Subcontract pursuant to the General Condition clause titled "TERMINATION FOR DEFAULT."

SC 4.5 SUBCONTRACT SCHEDULE

4.5.1 SUBCONTRACTOR shall, within fifteen (15) calendar days of Subcontract award, submit to CONTRACTOR for approval the Subcontract Schedule consisting of a detailed schedule meeting the milestone dates established in the Special Condition titled "COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK." This approved Subcontract schedule is the Project Baseline Schedule. No progress payments will be made until the SUBCONTRACTOR'S schedule has been accepted by the CONTRACTOR and annotated as a Status "1". The Subcontract Schedule shall be based on a critical path analysis of activities (as applicable) and sequence of operations needed for the orderly performance and completion of any separable parts of and all the Work in accordance with this Subcontract. The Subcontract Schedule shall be a resource loaded Critical Path Method (CPM) type in the form of a precedence diagram and activity listing. The schedule shall contain sufficient detail to identify critical schedule activities, CONTRACTOR interface, submittals required, inspection points, deliverables, and any other information pertinent to the performance of this Subcontract.

4.5.2 The Subcontract Schedule shall show in detail and in order of sequence, all activities, their descriptions, durations, production rate variances and dependencies, necessary and required to complete the Work, and any separable parts thereof. In addition to Milestones shown in SC 4.4.1 the following (minimum) list shall be included as specific activities:

4.5.3 The activity listing shall show the following information for each activity on the Subcontract Schedule:

1. Identification by activity numbers and descriptions
2. Craft (manpower) and equipment resource loaded activity sheets for Project Baseline Schedule
3. Early start and finish dates
4. Late start and finish dates
5. Identify any float time
6. Identify and describe any suspension of work, if applicable

4.5.4 The Subcontract Schedule shall be complete, covering activities at the Jobsite, off-site activities such as design, fabrication, procurement and jobsite delivery of SUBCONTRACTOR-furnished

equipment, and the scheduled Jobsite delivery dates of equipment to be furnished by CONTRACTOR, if any, and shall include a personnel forecast by crafts. SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans (resources, production rates, logistics/methodology, requirement for Radiological Control Technicians (RCTs), and CONTRACTOR deliverables) required for performing each separable part of Work.

- 4.5.5 The Subcontract schedule and revisions must be submitted in an electronic format compatible with Primavera Project Planner, Version 2.0 or later industry updates (WINDOWS) or as coordinated with CONTRACTOR. SUBCONTRACTOR shall promptly inform CONTRACTOR of any proposed change in the schedule and narrative and shall furnish CONTRACTOR with a revised schedule and narrative within ten (10) calendar days after approval by CONTRACTOR of such change.
- 4.5.6 The schedule and narrative shall be kept up to date, taking into account the actual Work progress and shall be revised, if necessary, every thirty (30) calendar days. The revised schedule and narrative shall, as determined by CONTRACTOR, be sufficient to meet the requirements to complete the separable parts of any and all of the Work, as set forth in this Subcontract.
- 4.5.7 During the performance of the Work, SUBCONTRACTOR shall submit to CONTRACTOR periodic progress reports in duplicate on the actual progress. Such reports shall be furnished as CONTRACTOR may request.
- 4.5.8 Such progress reports shall include the following:

- 1. Quarterly Chemical Inventory, (See Exhibit G and Exhibit J)
- 2. Monthly Accident and injury report summary, as required by Exhibit "A". General Condition titled SAFETY AND HEALTH, and Exhibit "G" Subcontractors Safety and Health Requirements, titled "Reporting Accidents and Incidents".
- 3. Monthly A copy of the Subcontract Schedule outlining progress to date for the major parts of the Work, as compared to scheduled progress, no later than the end of the month.
- 4. Monthly A comparison between planned and actual personnel by craft for Work performed to date, as required by CONTRACTOR.
- 5. Monthly A detailed and complete financial report in spreadsheet format showing as a minimum, current month. Past months, future month projections of pay item billings, percents of work complete by pay item no later than 10 working days after the end of each month.
- 6. Weekly A three-week look-ahead schedule showing forecast personnel by craft (if different from the original construction plan).
- 7. Weekly A three-week look-ahead schedule showing forecast progress of the Work, detailing discreet elements of work within each subcontract schedule activity, including forecast of personnel by craft, as required by CONTRACTOR.
- 8. Weekly A weekly report of quantities completed on items of the Work, as required by CONTRACTOR.
- 9. Weekly A weekly update of the estimate of labor hours for each activity or operation, as

required by CONTRACTOR.

10. Daily A daily force report listing all personnel by craft and Work performed by them,

SC 4.6 RESERVED

SC 4.7 SECURITY AND HAZARD COMMUNICATION PROGRAMS

- 4.7.1 A Security Program shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any event prior to commencing Work at the Jobsite. Such Program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, and shall include:

- 4.7.1.1 Controlled access to office, warehouse, material and equipment sites.
- 4.7.1.2 Accountability procedures for the requisition and issue of materials.
- 4.7.1.3 Periodic security checks for all work areas assigned to SUBCONTRACTOR.
- 4.7.1.4 Prompt reporting of incidents of loss, theft or vandalism to CONTRACTOR, subsequently detailed in writing.
- 4.7.1.5 Coordination and compliance with Site security programs.

- 4.7.2 A Hazard Communication Program shall be submitted in writing to the CONTRACTOR for approval and coordination with other jobsite activities within thirty (30) days after Subcontract award or prior to commencing work at the Jobsite. Such program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, (See Exhibit "G", Safety and Health Requirements), and shall include Identification of Hazard Communication Program responsibility and accountability. The Hazard Communication Program shall ensure:

- 4.7.2.1 Receipt and document control of Material Safety Data Sheets (MSDS) for materials being brought onto the Jobsite by the SUBCONTRACTOR or its suppliers and subtiers.
- 4.7.2.2 Employee training on MSDS's and in the handling and disposal of materials that fall under statutory regulations.
- 4.7.2.3 A disposal plan for removal of hazardous materials from the Jobsite. This plan must meet all federal/national, state and other applicable governmental requirements.

- 4.7.3 Subcontractor and all of Subcontractor's lower-tier subcontractors shall identify supervisory point(s) of contact (POCs) that will be on site whenever Subcontractor's/or lower-tier subcontractor's personnel are on site. The POC is responsible for notifying Subcontractor's personnel when an "Event Notification" occurs.

Event Notification will be broadcast on the WCH Intranet and via text messages to all POCs. The POC shall carry a cell phone at all times that is capable of sending and receiving text messages and the cell phone number shall be provided to the STR and kept up-to-date at all times.

SC 4.8 RESERVED

SC 4.9 SUBCONTRACTOR KEY PERSONNEL

- 4.9.1 CONTRACTOR reserves the right to approve all Key Personnel. SUBCONTRACTOR'S key personnel must be assigned full-time onsite to this Subcontract exclusively and possess the minimum qualifications listed below. SUBCONTRACTOR shall not reassign or remove key personnel without prior written authorization of CONTRACTOR. Whenever, for any reason, one or more of these individuals are unavailable for assignment for Work under this Subcontract, any replacement key personnel shall possess the minimum qualifications and experience required for the position.
- 4.9.2 When the CONTRACTOR finds that a correlation exists or appears to exist between a documented lack of SUBCONTRACTOR performance and a lack of SUBCONTRACTOR employee qualification performance and/or falsification of experience requirements, the SUBCONTRACTOR agrees to immediately replace that individual with another employee with the minimum qualifications appropriate to the work being performed as specified above at no additional cost to the CONTRACTOR.

CQA OFFICER

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.1 requirements.

CQA ENGINEER AND PROJECT MANAGER (FULLTIME ON SITE POSITION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.2 requirements.

BENTONITE ADMIX LANDFILL LINER CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING ADMIX PUGMILL SET UP, TEST PAD, OPERATION, AND PLACEMENT)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

GEOSYNTHETICS CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING GEOSYNTHETICS INSTALLATION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

SC 4.10 RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE

- 4.10.1 SUBCONTRACTOR shall not schedule materials and/or equipment for delivery to the Jobsite until such time as it is mobilized to receive and accept property at the Jobsite. CONTRACTOR reserves the right to require survey of any materials/equipment for presence of hazardous or radioactive substances before bringing the equipment/material into or from the Jobsite. Any deficiencies shall be corrected or replaced at SUBCONTRACTOR'S expense.
- 4.10.2 SUBCONTRACTOR is not permitted to use CONTRACTOR'S mailing address and in no case shall material or equipment be addressed in care of CONTRACTOR. It is recognized that special conditions may exist that would warrant assistance in the delivery of equipment or materials by CONTRACTOR. However, the SUBCONTRACTOR must have explicit prior written authorization from CONTRACTOR.

SC 4.11 RESERVED

5.0 THE CONTRACTOR

SC 5.1 CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS

- 5.1.1 CONTRACTOR will furnish specifications and design drawings for each part of the Work under this Subcontract. SUBCONTRACTOR shall, immediately upon receipt thereof, check all specifications and drawings furnished and shall promptly notify CONTRACTOR of any omissions or discrepancies in such specifications or drawings.
- 5.1.2 All specifications and drawings listed in Exhibit "E", SPECIFICATIONS and Exhibit "F", DRAWINGS are a part of this Subcontract. "Issued for Award" (IFA) specifications and drawings will be issued at the time of award and become a part of the Subcontract, superseding or supplementing the original drawings. SUBCONTRACTOR shall perform Work only in accordance with drawings marked IFA. If SUBCONTRACTOR considers such issue to be a change affecting cost or schedule, SUBCONTRACTOR must request an equitable adjustment in accordance with the General Condition titled "CHANGES."
- 5.1.3 SUBCONTRACTOR shall perform Work only in accordance with IFA drawings and any subsequent revisions thereto, and with CONTRACTOR reviewed drawings submitted by SUBCONTRACTOR in accordance with the Special Condition titled "SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES."
- 5.1.4 The CONTRACTOR shall maintain control of all electrical drawings. The SUBCONTRACTOR shall provide appropriate design and as-built to the CONTRACTOR for incorporation into the drawings.
- 5.1.5 One (1) copy of such specifications, and One (1) full size reproducible copy, and One (1) full size prints of such drawings will be furnished to SUBCONTRACTOR without charge. Any additional copies of such specifications and drawings will, upon SUBCONTRACTOR'S request, be furnished to SUBCONTRACTOR at the actual cost thereof.

SC 5.2 CONTRACTOR-FURNISHED UTILITIES AND SERVICES

- 5.2.1 Utilities. The utilities listed below and specifically detailed in the Specifications or Statement of Work, as applicable, will be furnished by CONTRACTOR without cost to SUBCONTRACTOR, provided that all such utilities will be furnished at outlets existing on the Jobsite and SUBCONTRACTOR shall, at its expense, extend such utilities from said outlets to points of use and at completion of all the Work remove all materials and equipment used for such extensions.

- 5.2.1.1 Water for construction
- 5.2.1.2 Potable water
- 5.2.1.3 Electrical services
- 5.2.1.4 Telecommunication lines

- 5.2.2 Services. The CONTRACTOR shall determine whether the services listed below, if required under this Subcontract, will be furnished by CONTRACTOR to support performance of Work by SUBCONTRACTOR.

- 5.2.2.1 Services of Non-Building Trades, bargaining craft Radiological Control Technicians (RCTs) who are members of the Hanford Atomic Metals Trades Council (HAMTC) to perform radiological monitoring.

5.2.2.2 CONTRACTOR will provide Radiological Dosimetry Services and Records, and Occupational Medical Services and Records.

5.2.3 **Facilities.** The facilities listed below will be furnished by CONTRACTOR. Such facilities may be used by SUBCONTRACTOR without charge therefore, provided that any such use will be subject to written approval of CONTRACTOR.

5.2.3.1 Office and Laboratory Testing Trailer with the following characteristics:

- Three offices (12' x 9' minimum)
- Laboratory space (21x16 space and including shelving). Electrical outlets will be provided in each office area, hallways, and at least six 110v outlets and one 220v outlet will be provided in the laboratory area.
- Daily janitorial service (trash service, vacuuming, mopping, etc.) provided by the CONTRACTOR.
- Office/lab trailer utilities (HVAC, electrical, etc.) will be provided and maintained by CONTRACTOR.

5.2.3.2 Temporary toilet facility with separate areas for males and females.

5.2.3.1 Jobsite parking area – The CONTRACTOR will designate an area near the operation for SUBCONTRACTOR personnel vehicle parking.

SUBCONTRACTOR shall be responsible for testing equipment, office supplies (copiers, computers, consumables, internet service, telecommunications, etc.), and furniture (including flammable storage cabinets).

SC 5.3 CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT

5.3.1 CONTRACTOR will furnish to SUBCONTRACTOR, at CONTRACTOR'S warehouse or Jobsite storage area, the items listed below to be incorporated into or used in performance of the Work under this Subcontract. Such items will be furnished, without cost to SUBCONTRACTOR, provided that SUBCONTRACTOR shall, at its expense, accept delivery thereof, load, unload, transport to points of use and care for such items until final disposition thereof. At time of acceptance of any such item from CONTRACTOR, SUBCONTRACTOR shall sign a receipt therefore. Signing of such receipt without reservation therein shall preclude any subsequent claim by SUBCONTRACTOR that any such items were received from CONTRACTOR in a damaged condition and with shortages. SUBCONTRACTOR shall account for such material and equipment in accordance with FAR 52.245.1 (June 2007). If at any time after acceptance of any such item from CONTRACTOR any such item is damaged, lost, stolen, or destroyed, such item shall be repaired or replaced at the expense of SUBCONTRACTOR. Items required to be replaced may, at its option, be furnished by CONTRACTOR. Upon completion of all the Work under this Subcontract, SUBCONTRACTOR shall, at its expense, return all surplus and unused items to CONTRACTOR'S warehouse or Jobsite storage area.

5.3.2 CONTRACTOR will exert every reasonable effort to make delivery of such materials and equipment so as to avoid delay in the progress of the Work. However, should CONTRACTOR, for any reason, fail to make delivery of any such item and a delay shall result, SUBCONTRACTOR shall be entitled to no additional compensation or damages on account of such delay. The only adjustment that will be made will be the granting of an appropriate extension of time.

SC 5.4 CONTRACTOR-FURNISHED PERMITS

The General Condition titled "PERMITS AND LICENSES" notwithstanding, CONTRACTOR will without cost to the SUBCONTRACTOR; furnish the permits required for performance of work on the Hanford Site. SUBCONTRACTOR shall, in accordance with said General Condition titled "PERMITS AND LICENSES", provide all other permits. All such CONTRACTOR-furnished permits are available for examination at the project office of CONTRACTOR during regular business hours.

SC 5.5 AUTHORITY OF PERSONNEL

- 5.5.1 The CONTRACTOR will designate a Subcontract Specialist to administer the Subcontract terms and conditions and act as the CONTRACTOR'S authorized representative. Additionally, all correspondence shall be issued and received by the designated Subcontract Specialist. Unless further delegated, in writing, by the Subcontract Specialist as set forth below, the only individual authorized to direct the SUBCONTRACTOR to deviate from the express, written terms of the Subcontract is the authorized Subcontract Specialist.
- 5.5.2 The CONTRACTOR will designate a Subcontract Technical Representative (STR) who will be responsible for the technical aspects of the performance of the Subcontract. The STR may designate other personnel to oversee the performance of the Work, sign field tickets, etc. However, the designated STR retains ultimate authority over the technical aspects of the Work. Should the SUBCONTRACTOR and STR disagree over the technical requirements of the Subcontract; such matters will be immediately referred to the CONTRACTOR'S Subcontract Specialist for resolution. Subcontract Specialist may advise SUBCONTRACTOR of further delegation of his/her authority as set forth above. Unless so advised, STR does not possess authority, express or implied, to direct the SUBCONTRACTOR to deviate from the terms and conditions of the Subcontract.

SC 5.6 DISPOSITION OF CONTAMINATED PROPERTY

- 5.6.1 The SUBCONTRACTOR is expected to bring equipment that is readily decontaminated. The SUBCONTRACTOR agrees to submit to CONTRACTOR for survey any equipment, tools, or other personal property brought into any Radiological Areas by the SUBCONTRACTOR, its employees, and any of its subcontractors and their employees.
- 5.6.2 The necessary survey to detect contamination will be performed immediately before removing any property from any location within the Jobsite Controlled Access Area or area specified by the CONTRACTOR. The SUBCONTRACTOR shall notify CONTRACTOR not less than three (3) working days before each property (including equipment and tools) removal.
- 5.6.3 The CONTRACTOR'S intent is to work with the SUBCONTRACTOR to release all SUBCONTRACTOR'S equipment through the efforts of equipment placement (minimization of contact) and decontamination efforts on affected equipment pieces (i.e., buckets, tracks, beds). Because of the known inventory of constituents within the excavation areas, CONTRACTOR cannot guarantee the full release of SUBCONTRACTOR'S equipment or parts thereof.
- 5.6.4 Any equipment, except for treatment equipment designed and intended to come into direct contact with contaminated material, that cannot be decontaminated or free released (radiological) in a timely manner will not be released back to the SUBCONTRACTOR and becomes the property of the CONTRACTOR/OWNER. At the sole discretion of the CONTRACTOR, additional compensation to the SUBCONTRACTOR may be made for the contaminated equipment.

5.6.5 In any event, the SUBCONTRACTOR shall be responsible for all CONTRACTOR and SUBCONTRACTOR costs incurred when contamination of equipment/material results from violation of CONTRACTOR'S Radiological Control Program.

5.6.6 Prior to release of any equipment, SUBCONTRACTOR shall consult with CONTRACTOR to determine whether decontamination is necessary.

6.0 GENERAL SUBCONTRACT PROVISIONS

SC 6.1 WORK HOURS AND FACILITY CLOSURE DAYS

6.1.1 Site Work Hours

6.1.1.1 Site Work hours are from 6:00 a.m. to 4:30 p.m. Monday through Friday (5 days per week, 10/hours per day). SUBCONTRACTOR shall be onsite when the Construction Subcontractor is performing work requiring Construction Quality Assurance (CQA) oversight. Deviation from the approved Site work hours shall be requested in writing from the CONTRACTOR and such approval shall not be unreasonably withheld, but shall be at the Contractor's discretion. The Subcontractor should plan to observe the same facility closure days as the CONTRACTOR.

CONTRACTOR recognizes the following Facility Closure days:

New Year's Day	Labor Day
*Presidents Day	Thanksgiving Day
Memorial Day	Day before Thanksgiving
Independence Day	Christmas Day
*Day before or after Christmas	

*Facility closure is not applicable to Building Trades Craft

Note: In the event a Facility Closure Day falls on a weekend (Friday, Saturday, or Sunday), it will be observed on an otherwise scheduled work day.

6.1.1.2 SUBCONTRACTOR is responsible for contacting the Subcontract Technical Representative with support requirements on Facility Closure dates with a 72-hour advance written notice to the CONTRACTOR. The SUBCONTRACTOR shall not perform any work at the jobsite on any Facility Closure Day without CONTRACTOR approval in advance.

6.1.1.3 SUBCONTRACTOR shall take into consideration that the above work schedule may be deviated from based upon the official Department of Energy, Richland Operations Office (RL) process for declaring changes to the Hanford Site work schedule due to inclement weather conditions. SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the general and local conditions, including, but not limited to, climatic conditions and seasons.

6.1.2 Notification System

There are three primary methods used to notify employees and subcontractors when site conditions necessitate a site closure, delay in the start of work, or early release from work.

6.1.2.1 Subcontractor employees may request their Subcontract Specialist or Subcontractor Technical Representative submit their name, cell phone number, and cell phone provider to the WCH text messaging notification system. In the event there are site

closures, for any reason, the recipient will receive a text message providing the information.

6.1.2.2 Subcontractor employees may refer to the WCH External Website. In the event of delays or site closures, a banner will be posted on the website.

6.1.2.3 Subcontractor employees may phone 372-9002 for emergency or site closure information.

6.1.3 Variable Conditions May Affect Site Areas Differently

6.1.3.1 Due to the size of the Hanford Site, adverse weather conditions may affect separate parts of the site differently. In these cases, the work delay/early release may only apply to those employees and/or Subcontractors working in the most affected areas. In the event a project needs an individual to be present onsite during adverse weather, CONTRACTOR shall notify SUBCONTRACTOR.

6.1.3.2 When the start of work is delayed due to inclement weather conditions, the adjusted start time is intended to give employees and/or Subcontractors adequate time to arrive at work safely. Arriving ahead of the adjusted start time could jeopardize the completion of maintenance work, and could put the employee at risk in terms of unsafe road conditions and/or unsafe walking surfaces at the work place. If a decision is made for an early release of employees and/or Subcontractors from work due to severe weather conditions, the CONTRACTOR will notify the SUBCONTRACTOR.

SC 6.2 WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL

6.2.1 Working Hours:

The SUBCONTRACTOR shall not perform Work at the Jobsite on other than the Site Work hours specified in subparagraph 6.1.1 above, unless it has given prior written notification to CONTRACTOR and has received approval in advance, as provided in this Special Condition.

6.2.2 Notification:

The SUBCONTRACTOR shall give CONTRACTOR at least four (4) hours prior notice if its employees are to be working after the site work hours specified in SC 6.1.1. The SUBCONTRACTOR shall give CONTRACTOR notice on the prior working day if its employees will be working before the site work hours specified in SC 6.1.1, or will be working at any time on Saturday, Sunday, or holidays. The notice shall include the type of Work to be performed, location of Work, date and hours of Work, and description of any heavy equipment to be used. CONTRACTOR advance approval is required any time Work is to be performed at other than normal shift periods.

SC 6.3 SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION

The Subcontract Performance Period shall commence on the date of Award of the Subcontract and extend through and including September 30, 2011.

SC 6.4 INCREMENTAL FUNDING OF SUBCONTRACT

The CONTRACTOR'S obligation to pay the Subcontract price in accordance with Section entitled, "Measurement for Payment and Payment for Work", of the Subcontract Special Conditions is subject to the provisions and limitations further set forth by the following. The CONTRACTOR'S obligation under this

Subcontract is hereby limited notwithstanding any provision of the "Measurement for Payment and Payment for Work" section or any other section or provision of this Subcontract.

- 6.4.1 Allotment of Funds: Of the total Subcontract price, only specific portions of the total amount are estimated to be available, allotted by FY, for this Subcontract. The CONTRACTOR shall not be obligated under this Subcontract to the SUBCONTRACTOR on any theory or basis for total payment in excess of total allotments up to that time. Furthermore, the SUBCONTRACTOR is not to expend any effort on Work for which the CONTRACTOR has not provided the SUBCONTRACTOR written authorization to proceed.

CONTRACTOR shall notify SUBCONTRACTOR of the estimated amount of funding to be available for each subsequent FY. It is contemplated, but not warranted, that the full amount of estimated funds for each FY's allotment will be available by October 1st, of each FY. CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the exact amount of each FY allotment of funds as soon as such becomes known.

6.4.2 Schedule:

6.4.2.1 The SUBCONTRACTOR agrees to schedule and perform or have performed the contract work in such a manner as to ensure that, in the event of termination of this contract pursuant to Subcontract General Conditions, Clause, "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) would not exceed the total amount allotted at the time to the Subcontract. The CONTRACTOR shall not be obligated in any event to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this subcontract, anything to the contrary or any other provision of this Subcontract notwithstanding.

6.4.2.2 To insure compliance with the requirements of subparagraph 6.4.2.1 above, all schedules required elsewhere in this Subcontract shall relate to and describe the SUBCONTRACTOR'S proposed plan for performance of work and representation of work actually performed to the amount then allotted to this Subcontract. Furthermore, SUBCONTRACTOR shall schedule and relate planning for future performance of Work to the estimated allotments to this Subcontract referenced in subparagraph 6.4.1, above.

- 6.4.3 Notices – Actions When Costs Approach Total Amounts Allotted: Until such time as the CONTRACTOR has allotted funds up to the full Subcontract price, including any adjustments thereto, the SUBCONTRACTOR shall notify the CONTRACTOR in writing 30 days in advance of the point when, in the event of termination of this Subcontract pursuant to the article hereof entitled "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) will approximate eighty-five percent (85%) of the total amount then allotted to the Subcontract. Upon receipt of such notice, the CONTRACTOR may take one of, or a combination of, the following actions:

6.4.3.1 Instruct the SUBCONTRACTOR to continue performance of the Subcontract to the extent permitted by the amount of funds then allocated to this Subcontract;

6.4.3.2 Increase the amount of funds allotted to the Subcontract and instruct the SUBCONTRACTOR to proceed with work not previously funded;

6.4.3.3 Order the SUBCONTRACTOR to suspend all or any part of the work in accordance with Subcontract General Conditions, "Suspension". If the suspension of work has resulted from the failure of the SUBCONTRACTOR to schedule and perform the Subcontract work in accordance with the provisions of subparagraph 6.4.2 above, the SUBCONTRACTOR shall not be entitled to an equitable adjustment in Subcontract price nor time, nor shall the costs of the suspension be allowable in any subsequent

termination of the Subcontract for the convenience of the CONTRACTOR, irrespective of the provisions of the "Suspension" article, the "Termination for Convenience" article, or any other section or provision of the Subcontract; or

6.4.3.4 Terminate the performance of all or part of the work under this Subcontract in accordance with the "Termination for Convenience" section; or

6.4.3.5 Direct the SUBCONTRACTOR to take such action, as is agreed by the parties in writing to be appropriate under the circumstances (provided such action does not exceed the total funds then allotted).

6.4.4 **SUBCONTRACTOR Excused From Further Performance:** Before the allotment of funds up to the total Subcontract price (including any adjustments thereto), when the SUBCONTRACTOR'S performance has reached the point at which in the event of exercise of the "Termination" section of this Subcontract, the total amount payable by the CONTRACTOR would equal 100% (one hundred percent) of the amount then allotted to this Subcontract, the SUBCONTRACTOR shall immediately notify the CONTRACTOR and shall make no further commitments or expenditures (except to meet existing commitments and liabilities). The CONTRACTOR shall not be obligated to pay the SUBCONTRACTOR an amount in excess of the total amount then allotted to the Subcontract. If additional funds are not allotted by the date set forth in subparagraph 6.4.1 above, or such later date as may be agreed to by both parties, the SUBCONTRACTOR shall not be obligated to continue performance under this Subcontract and the CONTRACTOR will, upon written request of the SUBCONTRACTOR, terminate the Subcontract pursuant to the provisions of the "Termination for Convenience" article, provided, however that in no event shall the CONTRACTOR be obligated to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this Subcontract.

6.4.5 If the SUBCONTRACTOR incurs additional costs or is delayed in the performance of the work under this Subcontract solely by reason of the failure of the CONTRACTOR to allot additional funds in accordance with the subparagraph 6.4.1 above, and if additional funds are allotted, equitable adjustments shall be made in Subcontract price and performance time.

6.4.6 The CONTRACTOR may at any time prior to termination, and with the consent of the SUBCONTRACTOR after notice of termination, allot additional funds to this Subcontract.

6.4.7 Nothing in this clause shall affect the right of the CONTRACTOR to terminate this Subcontract pursuant to the article of this Subcontract entitled, "Termination for the Convenience of the Government".

6.4.8 **Change Orders:** Changes issued pursuant to Subcontract General Conditions, "Changes", shall not be considered authorization for the SUBCONTRACTOR to exceed the amount allotted to this Subcontract in the absence of a statement in the Change Order, or other written notice to the SUBCONTRACTOR, increasing the amount allotted to this Subcontract.

SC 6.5 TECHNICAL DIRECTION

6.5.1 The term "technical direction" is defined as: (1) directions to the SUBCONTRACTOR, which shift work emphasis between work areas, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to facilitate the Subcontract Scope of Work; (2) provision of written information to the Subcontract that assists in the interpretation of drawings, specifications or technical portions of the work description; and (3) review and approval of technical reports, drawings, specifications, and technical information to be delivered by the SUBCONTRACTOR to the CONTRACTOR under the subcontract.

6.5.2 Technical direction must be within the Scope of Work stated in the subcontract. Unless so delegated, CONTRACTOR'S Subcontract Technical Representative (STR) does not have the

authority to, and may not issue any direction which: (1) constitutes an assignment outside the Scope of Work; (2) constitutes a change as defined in the Subcontract Clause, "Changes"; (3) in any manner causes an increase or decrease in the total estimated subcontract cost, the fixed unit rates, if any, or the time required for subcontract performance; and (4) changes any of the expressed terms and conditions.

6.5.3 The SUBCONTRACTOR shall proceed promptly with the performance of technical direction issued by the CONTRACTOR'S STR in the manner prescribed by this article and within the authority under the provisions of this article. If, in the opinion of the SUBCONTRACTOR, any instruction or direction by the CONTRACTOR'S STR falls within one of the categories defined in subparagraph 6.5.2 above, the SUBCONTRACTOR shall not proceed, but shall notify the Subcontract Administrator in writing within ten (10) working days after receipt of any such instruction or direction and shall request the Subcontract Administrator to modify the Subcontract accordingly.

6.5.4 A failure of the SUBCONTRACTOR and Subcontract Administrator to agree that the technical direction is within the Statement of Work or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the clause entitled, "Disputes".

SC 6.6 TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY)

Business related travel for non-represented employees is not generally authorized. In the event travel is authorized, SUBCONTRACTOR shall comply with WCH procedures. All authorized travel will be reimbursed in accordance with the Federal Travel Regulations (FTRs). Additionally, the following clauses apply:

6.6.1 En Route Expenses:

6.6.1.1 Transportation via public carrier will be reimbursed up to the equivalent of least cost economy (refundable) air fare plus actual and reasonable expenses in traveling shortest and most direct route from traveler's home office, to Richland Washington or at other such locations and return, at request of CONTRACTOR. Meals and incidental expenses (M&IE) includes meals, laundry, tips and phone calls to reserve lodging accommodations. Reimbursement for local travel is not authorized.

6.6.1.2 Subcontractor shall be reimbursed for lodging, subsistence and miscellaneous expenses incurred by SUBCONTRACTOR when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR consistent with the limits as described in the Federal Travel Regulations (FTR) set forth in 41 Code of Federal Regulations (CFR), latest supplement. This bulletin specifies expense limits for all geographical areas of the United States.

6.6.2 Automobile Rental:

Car rental expenses incurred by the subcontractor when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR for actual and reasonable cost incurred, supported by receipts.

6.6.3 Personal Automobile:

Mileage costs via the most direct route will be reimbursed at the current Government travel regulation rate. No reimbursement will be provided for a second automobile. Total costs for this mode of transportation may not exceed the total allowances that would have been provided had the employee traveled by public air carrier (including expenses to/from the airport and the lodging and M&IE per diem. Reimbursement for receipted toll charges is allowed over and above the mileage and M&IE.

6.6.4 Lodging, Meals, and Incidental Expenses:

6.6.4.1 Reimbursement for Temporary Assignment lodging, meals, and incidental expenses will be in accordance with the Lodging Plus methodology for the first thirty (30) days of assignment or until long-term lodging is obtained, whichever occurs first. After long-term lodging is obtained, or the thirty (30) day period has elapsed, the per diem allowance for lodging and meals and incidental expenses will be no more than seventy-five percent (75%) of the approved rate otherwise applicable.

6.6.4.2 Rental of a standard single apartment in the area, after long term lodging is obtained, or the 30-day period has elapsed, rent will be expensed via a Travel Expense Report. Proof of lodging, via receipts/copy of a signed lease agreement is required.

6.6.4.3 Subcontractors on single status assignments of three months or more may be granted trips home with approval, not to exceed a frequency of once every six weeks provided that a minimum of 30 days remain in the assignment. All travel shall be approved by the WCH STR based upon current work load.

Trips normally will be scheduled for weekends and will be on Subcontractor's time. Transportation and subsistence for trips home will be reimbursed subject to FTRs. If a Subcontractor elects to drive home, the amount may not exceed what the Subcontractor would have incurred for economy class round-trip airfare transportation home. Per Diem for M&IE is not paid during the "at-home" portion of a home leave. Lodging costs are not reimbursed for either the "en route" or the "at home" portion of home leave, however, lodging costs at the work location during home leave will be reimbursed if monthly rates are applicable.

6.6.5 Interruption of Per Diem:

During the per diem period, the meals/incidentals portion is forfeited in the following circumstances:

6.6.5.1 When Personal Time Off is taken in excess of two consecutive work days for reasons other than illness;

6.6.5.2 When Personal Time Off is taken for more than two consecutive days in conjunction with a weekend (e.g., Thursday, Friday, Weekend, Monday).

6.6.5.3 Any vacation period(s) taken in conjunction with travel including weekends or holidays taken in conjunction with vacation, and the periods covering return trips to the place of abode, are not reimbursable.

6.6.6 Other Provisions:

6.6.6.1 Receipts shall be provided substantiating travel expenses, lodging, rental cars, etc. Receipts are not required for meals and incidental expenses. Reimbursement for M&IE will not be made in excess of the maximum allowable daily totals.

6.6.6.2 This allowance shall be reduced on the first and last day of travel in accordance with the FTRs as follows:

Travel Duration	M&IE Reimbursement
Day of Departure	75% of Applicable M&IE Rate
Full day(s) of Travel	100% of Applicable M&IE Rate
Last Day of Travel	75% of Applicable M&IE Rate

- 6.6.6.3 Subcontractors on business travel in support of this Subcontract shall only be paid Labor Hours for travel during regular work hours. Any travel time paid in excess of 8 hours shall be paid at the regular straight time rate.

SC 6.7 INTEGRATED WORK CONTROL PROGRAM

Integrated Work Control (IWC) utilizes multi-disciplinary teamwork and worker involvement to support the identification, analysis, and mitigation of work site hazards; development of work packages; performance of work; and use of the observational approach for newly identified hazards. [10 CFR 851.21, and 22]. The work packages for construction of Cells 9 & 10 will be prepared by the Construction Subcontractor and will be developed and approved for release utilizing a graded approach based on risk and complexity of the work hazards and worker competence. [10 CFR 851.22].

The SUBCONTRACTOR's work performed within the Construction Subcontractor's work area shall be performed in accordance with the Construction Subcontractor's Integrated Work Control Program. The Integrated Work Control Program requirements are specified in Exhibit K.

SC 6.8 SAFETY INCENTIVE

6.8.1 Incentive

In addition to the need to protect the health and safety of the subcontractor's worker, the ability to maintain a safe and incident free work site ensures numerous financial benefits including a more productive work force, better relationships with the workers, lower insurance costs for subcontractors working, and few reports of incidents. The precise value of the items resulting from an accident at the site cannot be readily quantified. Therefore, the CONTRACTOR has allocated a quarterly financial incentive that allows the SUBCONTRACTOR the opportunity to earn an amount equal to Four Hundred Dollars (\$400.00) per eligible employee (computed in accordance with paragraph 6.8.3). Payment of incentive to SUBCONTRACTOR or sub-tier subcontractor employee is based on achieving zero OSHA Recordable Cases and OSHA Lost Work Day Cases (Days Away from Work, or restricted Work Days, or both), for WCH Hanford Site Work performed by SUBCONTRACTOR and SUBCONTRACTOR's sub-tier subcontractors as defined in paragraph 6.8.2 below.

6.8.2 Eligible Employees

6.8.2.1 Eligible SUBCONTRACTOR Employees are defined as any category of employee who works a minimum of three hundred (300) hours in any quarter for the SUBCONTRACTOR on a WCH project at the Hanford Site.

6.8.2.2 Eligible Sub-tier Subcontractor Employees are defined as any category of sub-tier subcontractor employee performing a minimum of three hundred (300) hours of long term field work during any calendar quarter when work is performed on a WCH Hanford Site project. Long term field work is defined a sub-tier subcontract work with a period of continuous performance in excess of six (6) months during the subcontract period of performance. The SUBCONTRACTOR will flow down the safety incentive to eligible sub-tier subcontractor employees meeting the criteria above.

6.8.3 Safety Incentive Periods and Computation

6.8.3.1 Initial Incentive Period – The Incentive Period will begin on the first day of the next month following the issue of approval by the CONTRACTOR for the SUBCONTRACTOR to mobilize at the Hanford Site. The first incentive payment will be pro-rated to the end of the current calendar year quarter.

6.8.3.2 Subsequent Incentive Periods – Subsequent Incentive Periods will be on a calendar quarter basis (January – March, April – June, July – September, or October – December) and continue through the end of the subcontract term. For a subcontract ending in mid-quarter, the incentive will be pro-rated based on the number of weeks completed in that quarter.

The recordable and Lost Work Day criteria and corresponding percentage of Safety Incentive earned are specified in the following table:

**Safety Performance Incentive Fee Schedule
Quarterly Safety Goals**

Safety Incident	One OSHA TRC recordable injury or illness (Medical Treatment or DART-Restricted Case)	Two OSHA TRC recordable injury or illnesses (Medical Treatment or DART-Restricted Case)	One OSHA recordable Lost Workday Case (Day Away DART-Day Away Case)	One or more OSHA TRC or DART Case(s) in each of two consecutive quarters
Reductions to Incentive Earned	Fifty percent (50%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive

Note: Failure to report an injury or accident, or the intentional and unauthorized altering of the scene of an injury or accident will result in a one hundred percent (100%) reduction of the quarterly incentive fee for two consecutive quarters.

6.8.3.3 Safety Incentive Payment – The Safety Incentive will be paid quarterly on the basis of four hundred dollars (\$400) per eligible employee per quarter to include sub-tier subcontractors as outlined above. The SUBCONTRACTOR will supply to the CONTRACTOR a listing of employees eligible to receive the incentive on a quarterly basis, which will establish the total potential amount of the incentive, subject to reductions as listed above. Subsequent to the distribution of incentive to employees in each quarter, SUBCONTRACTOR will provide to CONTRACTOR confirmation that the listed eligible employees received incentive payouts. An eligible employee is defined as a SUBCONTRACTOR employee that has worked for the SUBCONTRACTOR on a WCH project for a minimum of three hundred (300) hours in the quarter (See 6.8.2).

6.8.3.4 At SUBCONTRACTOR's discretion, a portion of the Safety Incentive may be retained for safety-related lunches, prizes, gifts, etc. for the benefit of the work force; however, it is expected that at least ninety percent (90%) will be passed along to SUBCONTRACTOR employees in the form of an equally distributed cash payout.

6.8.3.5 Where the SUBCONTRACTOR has an eligible sub-tier subcontractor, the total sub-tier subcontractor incentive amount will be based on four hundred dollars (\$400) per employee per quarter (see 6.8.2.2), minus any deductions outlined in the Safety Performance Incentive Fee Schedule. The SUBCONTRACTOR will inform the sub-tier subcontractor of the expectation to pass along at least ninety percent (90%) of the incentive to its employees in the form of equally distributed cash payouts.

SC 6.9 CERTIFIED PAYROLL

6.9.1 Except as noted below, SUBCONTRACTOR(S) shall strictly adhere to the provisions stated in the FAR Clause 52.222-8, "Payrolls and Basic Records (Nov 2009)," see Exhibit A, "Government Flowdowns."

6.9.1.1 Employee full Social Security Numbers and personal addresses shall not be included on Certified Payroll Submittals. The last four digits of the employee's Social Security Number shall be used to provide a uniquely identifiable number for each employee. The submittal of this information is considered Personal Identifiable Information which necessitates transmission with encryption software to be supplied by WCH. Subcontractor shall within thirty (30) days of award notify WCH with the names of the employees who will transmit the PII. WCH must be informed if the responsibility for transmitting the data changes to another employee.

6.9.1.2 SUBCONTRACTOR and lower tier subcontractors, shall ensure that employee personal information is readily available if requested by DOE-RL or the CONTRACTOR. Use of the Government's Certified Payroll form located at <http://www.dol.gov/whd/forms/wh347.pdf> is not required on condition that all information is provided on the form as set forth in FAR Clause 52.222-8.

EXHIBIT "B"

SPECIAL CONDITIONS

CONSTRUCTION SUBCONTRACTS

**ERDF SUPER CELLS 9 & 10 CONSTRUCTION QUALITY
ASSURANCE (CQA)**

SUBCONTRACT NUMBER S013213A00

**EXHIBIT B
SPECIAL CONDITIONS
CONSTRUCTION SUBCONTRACT**

WASHINGTON CLOSURE HANFORD LLC

TABLE OF CONTENTS

SC	Title	Page No.
1.0	SCOPE	1
2.0	DEFINITIONS	1
3.0	TERMS OF PAYMENT	1
SC 3.1	RESERVED	1
SC 3.2	RESERVED	1
SC 3.3	MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK	1
SC 3.4	EXPENDITURE NOTIFICATION.....	4
SC 3.5	PRICING ADJUSTMENTS	5
4.0	THE SUBCONTRACTOR.....	7
SC 4.1	POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	7
SC 4.2	Reserved	7
SC 4.3	SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES	7
SC 4.4	COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK	10
SC 4.5	SUBCONTRACT SCHEDULE.....	12
SC 4.6	Reserved	14
SC 4.7	SECURITY AND HAZARD COMMUNICATION PROGRAMS.....	14
SC 4.8	Reserved	14
SC 4.9	SUBCONTRACTOR KEY PERSONNEL	15
SC 4.10	RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE.....	15
SC 4.11	Reserved	16
5.0	THE CONTRACTOR.....	16
SC 5.1	CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS	16
SC 5.2	CONTRACTOR-FURNISHED UTILITIES AND SERVICES	16
SC 5.3	CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT	17
SC 5.4	CONTRACTOR-FURNISHED PERMITS.....	18
SC 5.5	AUTHORITY OF PERSONNEL.....	18
SC 5.6	DISPOSITION OF CONTAMINATED MATERIAL	20
6.0	GENERAL SUBCONTRACT PROVISIONS	19
SC 6.1	WORK HOURS AND FACILITY CLOSURE DAYS.....	19
SC 6.2	WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL.....	20
SC 6.3	SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION.....	20
SC 6.4	INCREMENTAL FUNDING OF SUBCONTRACT	20
SC 6.5	TECHNICAL DIRECTION	22
SC 6.6	TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY).....	23
SC 6.7	INTEGRATED WORK CONTROL PROGRAM.....	25
SC 6.8	SAFETY INCENTIVE.....	25

1.0 SCOPE

This Exhibit B provides Special Terms and Conditions that apply specifically to this Subcontract and SUBCONTRACTOR providing construction technical services to Washington Closure Hanford LLC.

2.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH) and all of its authorized representatives acting in their professional capacities in performance of OWNER'S Contract No. DE-AC06-05RL14655. To the extent that the CONTRACTOR is not the ultimate user of the services required herein, all rights, benefits and remedies conferred by Subcontractor shall also accrue and be available to and are for the express benefit of the OWNER for which the Services are required.

"JOBSITE" and "SITE" means the location(s) at which or for which the Services will be provided.

"OWNER" means the United States Department of Energy (DOE) / United States Government.

"WORK" and "SERVICES" means all technical and professional Services and responsibilities to be performed by the SUBCONTRACTOR as specified, stated, indicated or implied in the Master Agreement Subcontract or Job Order, including the furnishing and supervision of all technical personnel and the supply of all equipment, materials and supplies necessary or required to perform the Master Agreement Subcontract or Job Order.

"SUBCONTRACTOR" means the company, corporation, partnership, individual or other entity to which the Master Agreement Subcontract or Job Order is issued, its authorized representatives, successors, and permitted assigns.

"PROGRAM" means the performance of the requirements of Contract No. DE-AC06-05RL14655

"SUBCONTRACT TECHNICAL REPRESENTATIVE" is designated by the CONTRACTOR as the individual responsible for the technical aspects of the performance of the Subcontract.

"SUBCONTRACT SPECIALIST" is designated by the CONTRACTOR as the individual responsible for administering the Subcontract terms and conditions and who acts as CONTRACTOR's authorized representative.

3.0 TERMS OF PAYMENT

SC 3.1 RESERVED

SC 3.2 RESERVED

SC 3.3 MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK

3.3.1 For the purpose of arriving at agreement on the basis for progress payments for items bid as lump sum, SUBCONTRACTOR shall, within fifteen (15) calendar days after award, submit a proposed breakdown of values of the various elements of the Work comprising the lump sum item. Such submittal shall also include a proposed schedule of monthly progress payments. The proposed breakdown and payment schedule shall be correlated with the schedule and reports required by the Special Condition entitled "SUBCONTRACT SCHEDULE". Such breakdown and payment schedule shall be subject to CONTRACTOR'S approval.

- 3.3.2 Estimates shall be prepared by SUBCONTRACTOR and submitted in writing for CONTRACTOR'S approval on or about the end of each month covering the amount and value of Work satisfactorily performed by SUBCONTRACTOR up to the date of such estimate. Such estimate may be made by strict measurement, or by estimate, or partly by one method and partly by another. Estimates shall be based on cumulative total quantities of Work performed. Estimates may include materials or equipment not incorporated into the Work. The quantity of Work to be paid for under any item for which a unit price is fixed in the Subcontract shall be the amount or number, approved by CONTRACTOR, of units of Work satisfactorily completed in accordance with this Subcontract and computed in accordance with applicable measurement for payment provisions of this Subcontract.
- 3.3.3 SUBCONTRACTOR shall make all surveys necessary for determining quantities of Work to be paid for under this Subcontract. Copies of field notes, computations, and other records made by SUBCONTRACTOR to determine quantities shall be furnished to CONTRACTOR upon request. SUBCONTRACTOR shall notify CONTRACTOR before such surveys are made.
- 3.3.4 CONTRACTOR, at its discretion, may arrange to have its representative witness and verify surveys made by SUBCONTRACTOR for determining quantities of Work to be paid for under this Subcontract. Measurements and computations shall be made by such methods as CONTRACTOR may consider appropriate for the class of Work measured, and the estimate of quantities of Work completed shall be compatible with the reporting requirements required hereunder by the Special Condition titled "SUBCONTRACT SCHEDULE". The dividing limits, lines, or planes between adjacent items or classes of excavation, concrete, or other types of Work where not definitely indicated on the drawings or in the specifications shall be as determined by CONTRACTOR.
- 3.3.5 Review by CONTRACTOR of SUBCONTRACTOR'S estimate of the amount and value of the Work performed will be within ten (10) calendar days of its receipt and a copy of the estimate as approved returned to SUBCONTRACTOR. SUBCONTRACTOR shall prepare and submit to CONTRACTOR an invoice in accordance with the estimate as approved. SUBCONTRACTOR shall certify in each application for payment that there are no known outstanding mechanic's or material-men's liens and that all due and payable bills have been paid or are included in the application for payment. Such certification shall be on the CONTRACTOR furnished "Request for Payment (Construction Subcontracts)" form that may be down-loaded from www.wch-rc.com. In addition, an Electronic Funds Transfer (EFT) form is provided to allow payments to be forwarded to the SUBCONTRACTOR'S bank account electronically. The EFT form will need to be completed by the CONTRACTOR and the CONTRACTOR'S bank. The bank needs to return the form to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attn: Accounts Payable

- 3.3.6 Reserved
- 3.3.7 CONTRACTOR may, as a condition precedent to any such payment to SUBCONTRACTOR, require SUBCONTRACTOR to submit complete waivers and releases of all claims of any person, firm, or corporation in connection with or in any way related to the performance of this Subcontract. Upon request, SUBCONTRACTOR shall also furnish acceptable evidence that such claims have been satisfied.
- 3.3.8 SUBCONTRACTOR shall submit, as required by CONTRACTOR, on a monthly basis, an accurate current and complete list of open purchase orders and subcontracts which include contact information (name and telephone number). CONTRACTOR reserves the right to use the contact information to verify prompt payment by SUBCONTRACTOR.

- 3.3.9 Any amounts otherwise payable under this Subcontract may be withheld, in whole or in part, if:
- (a) Any claims are filed against SUBCONTRACTOR by CONTRACTOR, OWNER or third parties, or if reasonable evidence indicates the probability of filing any such claims; or
 - (b) SUBCONTRACTOR is in default of any Subcontract condition including, without limitation, the schedule, quality, and safety requirements; or
 - (c) There is reasonable doubt that this Subcontract can be completed within the time specified or for the balance then unpaid; or
 - (d) SUBCONTRACTOR has not submitted:
 - 1. Schedules and progress reports, as defined in the Special Condition titled "SUBCONTRACT SCHEDULE",
 - 2. Property insurance certificates, or not provided proper coverage or proof thereof,
 - 3. Its safety, security, and fire prevention plans, or
 - 4. Waivers and Releases or Waivers and Releases submitted with invalid information.
 - 5. Certified copies of payroll records required that are up to date to within two (2) weeks of the date SUBCONTRACTOR submits any invoice for payment.
- 3.3.10 CONTRACTOR will pay such withheld payments if SUBCONTRACTOR:
- (a) Pays, satisfies, or discharges any claim of CONTRACTOR, OWNER, or third parties against SUBCONTRACTOR arising out of or in any way connected with this Subcontract; or
 - (b) Cures all defaults in the performance of this Subcontract.
- 3.3.11 If claims filed against SUBCONTRACTOR connected with performance under this SUBCONTRACT are not promptly removed by SUBCONTRACTOR after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may remove such claims and deduct all costs in connection with such removal from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. If the amount of such withheld payment or other monies due SUBCONTRACTOR is insufficient to meet such costs, or if any claim against SUBCONTRACTOR is discharged by CONTRACTOR after final payment is made, SUBCONTRACTOR shall promptly pay CONTRACTOR all costs incurred thereby, regardless of when such claim arose or whether such claim imposed a lien upon the Project or the real property upon which the Project is situated.
- 3.3.12 If CONTRACTOR is notified that SUBCONTRACTOR has failed to pay valid invoice submitted by sub-tier supplier or subcontractor in accordance with the payment terms of a valid sub-tier subcontract or purchase order for expenditures made under the scope of work of the SUBCONTRACT, SUBCONTRACTOR shall promptly pay such invoice. If invoices are not promptly paid by SUBCONTRACTOR within seven (7) days after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may pay such invoices directly to the sub-tier supplier or subcontractor and deduct all costs in connection with such payment from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. CONTRACTOR also reserves the right to require SUBCONTRACTOR to submit separate invoices for any or all sub-tier subcontractors or suppliers and to make payment to the sub-tier supplier or subcontractor on behalf of SUBCONTRACTOR.

- 3.3.13 If a lien is filed, SUBCONTRACTOR shall remove the lien, or see that it is removed or shall furnish a bond for the full amount thereof within seven (7) calendar days of notice by CONTRACTOR. SUBCONTRACTOR shall obtain for itself legally effective waivers of lien and furnish same to CONTRACTOR with each application for payment. Failure to comply with the foregoing requirements shall constitute grounds for termination of this Subcontract in accordance with the General Condition titled, 'TERMINATION FOR DEFAULT'.
- 3.3.14 Upon receipt by SUBCONTRACTOR of CONTRACTOR'S written notice of Final Acceptance of the Work under this Subcontract, SUBCONTRACTOR shall prepare an estimate in writing for CONTRACTOR'S approval of the amount and value of all Work satisfactorily completed under this Subcontract. Upon CONTRACTOR'S approval of such estimate, SUBCONTRACTOR shall prepare and submit its final invoice in accordance with the approved estimate. Unless otherwise specified by applicable law, CONTRACTOR shall, within sixty (60) calendar days following Final Acceptance and after submittal of such invoice, pay to SUBCONTRACTOR the amount then remaining due, provided that, SUBCONTRACTOR shall have furnished CONTRACTOR and OWNER for itself, its subcontractors, immediate and remote, and all material suppliers, vendors, laborers, and other parties acting through or under it, waivers and releases of all claims against CONTRACTOR or OWNER arising under or by virtue of this Subcontract, except such claims, if any, as may with the consent of CONTRACTOR and OWNER be specifically excepted by SUBCONTRACTOR from the operation of the release in stated amounts to be set forth therein.
- 3.3.15 No payments of invoices or portions thereof shall at any time constitute approval or acceptance of Work under this Subcontract, nor be considered to be a waiver by CONTRACTOR or OWNER of any of the terms of this Subcontract. However, title to all material and equipment for which payment has been made, whether or not the same has been incorporated in the Work, and title to all completed Work whether paid for or not, shall vest in CONTRACTOR, or OWNER as the case may be, and in any case shall not be part of SUBCONTRACTOR'S property or estate in the event SUBCONTRACTOR is adjudged bankrupt or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of SUBCONTRACTOR'S insolvency.
- 3.3.16 Invoices for monthly progress payments and final payment should be signed and submitted along with a completed and signed "Request for Payment (Construction Subcontracts)" form in one (1) original copy to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Accounts Payable
Reference: Subcontract Number: **S013213A00**

SC 3.4 EXPENDITURE NOTIFICATION

- 3.4.1 SUBCONTRACTOR shall furnish to the address below the best estimate of the total billable cost (invoiced and invoiceable) from Award of the Subcontract through the current calendar month end. This information must be submitted in writing (facsimile acceptable) no later than the 15th of each month.

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Subcontract Specialist
Dana Looney (509) 372-9499
Fax: (509) 372-9049.

- 3.4.2 For Work performed on a unit-rate basis, SUBCONTRACTOR shall notify the CONTRACTOR'S Subcontract Specialist in writing when SUBCONTRACTOR expects that in the next sixty (60) calendar days billable charges, when added to all previously billed charges, will exceed seventy-five percent (75%) of the estimated Subcontract value shown in Exhibit "C". Upon expending seventy-five percent (75%) of the estimated Subcontract value, SUBCONTRACTOR shall provide the CONTRACTOR'S authorized representative with weekly written summaries of billable charges, inclusive of previously billed charges.
- 3.4.3 The CONTRACTOR is not obligated to reimburse the SUBCONTRACTOR for billable charges in excess of the estimated Subcontract value, as modified. The SUBCONTRACTOR is not obligated to continue performance under this Subcontract once billable charges reach one hundred percent (100%) of the estimated Subcontract value, as modified.

SC 3.5 PRICING ADJUSTMENTS

When costs are a factor in any determination of a Subcontract adjustment pursuant to the General Condition titled, "CHANGES", or any other provision of this Subcontract unless excluded therein, such direct and indirect costs, upward or downward, for labor, equipment, and material necessary to perform the Work of the Change shall be determined in accordance with the following:

- 3.5.1 Determination of direct labor hours for changes involving added or deleted work shall be as follows:
- (a) Direct labor hours necessary to perform the Work or the Change shall be established by applying standards from the most recent edition of *Building Construction Cost Data* (Means), published by R. S. Means Company, Inc.; or other CONTRACTOR-approved data-base, as may have been previously developed by SUBCONTRACTOR.
 - (b) In addition to direct payroll costs, direct labor costs shall include payroll taxes and insurance, vacation allowance, subsistence, travel allowance, overtime premium and any other payroll additives required to be paid by SUBCONTRACTOR by law or labor agreement(s) (e.g., Department of Labor Wage Determination, bargaining agreements such as the Hanford Site Stabilization Agreement, etc.).
 - (c) Charges for labor furnished and used by SUBCONTRACTOR shall include all manual classifications up to and including foremen. Labor rates used to calculate the costs shall be those rates in effect during accomplishment of the change. Charges shall not be included for superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics. These charges will be included in the indirect rate as set forth below.
- 3.5.2 Determination of direct costs of equipment for changes involving added or deleted work shall be as follows:
- (a) Allowable equipment costs of in-use or stand-by SUBCONTRACTOR-owned equipment will be computed by utilizing eighty percent (80%) of the rates set forth in the most current *Rental Rate Blue Book for Construction Equipment* (hereinafter referred to as the Blue Book), found at www.equipmentwatch.com, as adjusted for age of equipment in Region "F" provided such rates exclude unallowable or unacceptable costs in accordance with FAR 31.105. Hourly rates will be developed by using monthly rates divided by 166.7 hours based on a 4 day/10 hour per day work schedule...
 - 1. In-use or operating equipment rates will be developed by calculating the depreciation, major overhaul, and cost of facilities capital (CFC) portion of the Blue

Book rates. Blue Book indirect costs will not be allowed (they should be included as indirect rates as set forth below). The estimated operating cost per hour for consumables, including, but not limited to, maintenance labor and parts, fuel, oil, filters, lubricants, and tires will be allowed.

2. Stand-by equipment rates will be developed by calculating the CFC portion and one-half the depreciation portion of the Blue Book rate element table allowance. Blue Book indirect costs and major overhaul costs will not be allowed. The estimated operating cost per hour for consumables, including but not necessarily limited to, maintenance labor and parts; fuel, oil, filters, lubricants, and tires can not be included.
 - (b) Equipment costs of in-use or stand-by SUBCONTRACTOR-rented equipment shall be computed as follows: CONTRACTOR shall develop "market rates" commensurate with rates from equipment rental firms for similar equipment within the area. Should SUBCONTRACTOR-proposed rates not be comparative, CONTRACTOR reserves the right to delete unreasonable charges.
 - (c) When the equipment is operated infrequent and such equipment need not remain at the site of the Work continuously, as determined by the CONTRACTOR, charges shall be limited to actual hours of use. Equipment not operating, but retained at the jobsite at CONTRACTOR'S direction, shall be charged at the standby rate.
- 3.5.3 Direct costs of materials for changes involving added or deleted work shall be determined in the following ways:
- (a) From published supplier pricing data or written quotes from suppliers on specific items where published pricing data is not generally available (invoices from suppliers are acceptable); or
 - (b) From standards published in Means, or other CONTRACTOR-approved data previously developed by SUBCONTRACTOR if information identified in paragraph (a) above is not available.
- 3.5.4 When pricing adjustments, the following are considered to be included as indirect costs, and as such may not be considered, and will not be compensated, as direct costs. Jobsite office expenses, incidental job burdens, small tools, general office overhead allocation, and costs for estimating the price of changed work.
- 3.5.5 The following shall apply to determine the indirect cost portion of Subcontract Price adjustments. CONTRACTOR recognizes Washington State business and occupation (B&O) tax rate of RCW 82.04.263 (currently 0.471 percent) as applicable to price adjustments to this Subcontract. Paragraphs (a), (b), and (c) below will apply when the adjustment does not meet the criteria for submittal of Certified Cost and Pricing data. **It must be emphasized that indirect rates in the paragraph (b) and (c) below are maximum rates and CONTRACTOR reserves the right to negotiate the indirect expense rates within the ceiling limitations.**
- (a) SUBCONTRACTOR'S and lower-tier subcontractor's overhead and profit shall be considered to include the following: insurance cost; small tools having a purchase price of \$500.00 or less; incidental job burdens; general home office expenses commonly known as G&A; labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics, as well as any other items specified for Overhead and Operations in Exhibit C. Unless otherwise stated, no separate allowance will be made and costs of premium adjustments, consequent upon changes ordered, for Payment and Performance Bonds (allowable for SUBCONTRACTOR only).

Note labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics are included in overhead & profit when the change notice occurs in the timeframe of the subcontract baseline schedule. If the change notice takes place outside the baseline schedule (i.e. added scope) then direct labor charges for these types of personnel are allowed.

- (b) Overhead and Profit allowance for SUBCONTRACTOR or lower-tier subcontractors on work performed by lower-tier subcontractors shall be calculated as follows: a maximum mark-up of ten percent (10%) shall be applied to the aggregate of sub-tier subcontractor charges less than or equal to \$25,000; a maximum mark-up of seven and one-half percent (7 ½%) shall be applied to the aggregate of sub-tier subcontractor charges greater than \$25,000 but less than or equal to \$650,000; a maximum mark-up of five percent (5%) or \$100,000, whichever is less shall be applied to the aggregate of sub-tier subcontractor charges greater than \$650,000.
- (c) For parties performing the Work, overhead and profit on changes shall be calculated not to exceed the following: ten percent (10%) overhead and ten percent (10%) profit on total direct costs up to \$25,000; seven and one-half percent (7 ½%) overhead and seven and one-half percent (7 ½%) profit on total direct costs over \$25,000.00, but less than \$650,000; five percent (5%) of total direct costs or \$100,000 whichever is less, for overhead and profit combined on total direct costs over \$650,000.
- (d) Overhead and profit shall be calculated utilizing the net increase in price of the change after deductions have been taken.
- (e) Credit for overhead and profit shall be included as part of the downward adjustment for a deductive change.

3.5.6 Any change in excess of \$650,000 will require cost and pricing data as part of the proposal for the change.

4.0 THE SUBCONTRACTOR

SC 4.1 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

- 4.1.1 Within ten (10) working days of Subcontract execution and prior to commencement of any Work, SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.
- 4.1.2 Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the Work.

SC 4.2 RESERVED

SC 4.3 SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES

- 4.3.1 SUBCONTRACTOR shall submit drawings, data, samples, and other submittals in accordance with Exhibit "I", "Subcontractor Submittal Requirements Summary," of this Subcontract.

CONTRACTOR will require a fourteen (14) calendar day review period for drawings, data, samples, and other submittals.

4.3.2 Review and permission to proceed by CONTRACTOR, as stated in this Special Condition, does not constitute acceptance or approval of design details, calculations, analyses, test methods, certificates, or materials developed or selected by SUBCONTRACTOR and does not relieve SUBCONTRACTOR from full compliance with contractual obligations. Drawing categories and their associated requirements include, but are not limited to, the following:

4.3.2.1 Issued for Construction (IFC) Drawings may be required for:

- Fabrication of SUBCONTRACTOR-furnished equipment,
- Installing SUBCONTRACTOR-furnished material or equipment,
- Planning and performance of the Work under this Subcontract
- Installing energized utility systems.

IFC drawings shall be prepared by the SUBCONTRACTOR in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." The drawings shall be submitted by and at the expense of SUBCONTRACTOR before fabrication, installation, or performance is commenced, allowing at least fourteen (14) calendar days for review by CONTRACTOR unless otherwise shown on the Subcontract Schedule. IFC drawings submitted by the SUBCONTRACTOR and reviewed by CONTRACTOR shall form a part of this Subcontract. Such drawings shall include, but not be limited to, matchmarks, erection diagrams, and other details, such as field connections for proper installation, erection of the equipment, and performance of the Work.

Drawings submitted by SUBCONTRACTOR shall be certified by SUBCONTRACTOR to be correct, shall show the Subcontract number, and shall be furnished in accordance with the Subcontract Submittal Requirements Summary (SSRS) form(s).

Design changes to the IFC drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.2 Samples:

Samples, if required, shall be submitted by and at the expense of SUBCONTRACTOR. Such submittals shall be made not less than thirty (30) calendar days before the time that the materials represented by such samples are needed for incorporation into the Work. Samples shall be subject to review and materials represented by such samples shall not be manufactured, delivered to the Jobsite, or incorporated into the Work without such review.

Each sample shall bare a label showing SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, brand name, model number, supplier's name, and reference to the appropriate drawing number, technical specification section and paragraph number, as applicable.

Samples that have been reviewed may, at CONTRACTOR'S option, be returned to SUBCONTRACTOR for incorporation into the Work.

4.3.2.3 Data and Certificates:

Four (4) copies of each required certificate shall be submitted by and at the expense of SUBCONTRACTOR. Such submittal shall be made not less than thirty (30) calendar days before the time that the materials represented by such certificates are needed for incorporation into the work. Certificates shall be subject to review, and material represented by such certificates shall not be fabricated, delivered to the jobsite, or incorporated into the Work without such review.

Certificates shall clearly identify the material being certified and shall include, but not be limited to, providing the following information: SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, and reference to the appropriate drawing, technical specification selection and paragraph number, as applicable.

4.3.2.4 Working Drawings and Design Changes:

During construction, the SUBCONTRACTOR shall keep an up-to-date set of working drawings on the jobsite as an accurate record of deviations between Work as shown on the IFC drawings and Work as installed. These drawings shall be available to CONTRACTOR and OWNER for inspection. The working drawings, including any initial as-built drawings, shall be available for inspection at the SUBCONTRACTOR's field office at the jobsite.

Design changes to the IFC drawings, including the redlining process, shall be made in accordance with the Technical Specification 000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.5 As-Built Drawings:

The SUBCONTRACTOR shall provide the as-built information submittals as described below and as detailed in Exhibit I.

4.3.2.5.1 Required Submittals. The SUBCONTRACTOR shall, at its expense, furnish to the CONTRACTOR the following submittals:

- Initial as-built drawings for energized utility systems. Drawings shall show the energized utility system configuration at the time it was placed into service.
- Final as-built drawings for all IFC and initial as-built drawing.

The content, level of detail, accuracy of location and format of the as-built drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." Design change process for initial as-built and final as-built drawings shall be in accordance with Technical Specification 0000X-SP-X0001.

4.3.2.5.2 Submittal Schedule. SUBCONTRACTOR shall furnish the as-builts drawing submittals in accordance with the schedule below:

- Initial as-built drawing for electrical utility systems – Due not later than thirty (30) calendar days after final energization of the system.
- Initial as-built drawings for non-electrical utility systems – Due not later than thirty (30) calendar days after installation is complete. CONTRACTOR approval of the as-built submittal is required prior to using the non-electrical utility.
- Final as-built drawings for all work including energized utility systems due not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment.

4.3.2.6 As-Built Specifications:

SUBCONTRACTOR shall, at its expense and not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment, furnish to CONTRACTOR a complete set of marked-up, final as-built specifications with FINAL AS-BUILT clearly printed on the cover and associated electronic file. SUBCONTRACTOR shall accurately and neatly transfer all annotations from progress as-builts to final as-builts.

Deviations from specifications must be supported by Request for Information (RFI), Supplier Deviation Disposition Request (SDDR), or Design Change Notice (DCN).

4.3.2.7 Electronic Files:

As-built drawings submittals shall be prepared using acceptable and compatible software as determined by the CONTRACTOR. Submittal documents shall be delivered in the quantities as specified in Exhibit I and accompanied by an electronic media version.

4.3.2.7.1 Specifications: Textual material shall be converted to Microsoft Word and shall have a ".doc" extension.

4.3.2.7.2 Drawings: Design drawings shall be prepared by SUBCONTRACTOR in accordance with Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.8 Energized Systems:

Energized systems include, but are not limited to, the following:

- Electric Power and Control Systems (except telephone and computer systems)
- Pressurized piping systems
- Sanitary and process sewer systems

The SUBCONTRACTOR shall submit approved design and "as-built" information for energized systems (including detailed routing of above and below grade components) to the WCH Project Engineer as described above in the titled section "As-built Drawings." For electrical utility installations, the SUBCONTRACTOR shall have a "Hold Point" clearly stated in their work procedures/instructions requiring an NEC Inspection prior to final energizing of the affected system(s). The SUBCONTRACTOR shall have the current up-to-date working drawings for the system available for the NEC inspector's use. The final energization inspection shall only be undertaken by the NEC inspector if the working drawings are current and correctly show the configuration of the work to be inspected.

SC 4.4 COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK

4.4.1 SUBCONTRACTOR shall complete the Work under the Subcontract to meet the following Subcontract Milestones measured in calendar days from Notice to Proceed (NTP) with on-site Work of the Subcontract:

ERDF CELLS 9 & 10 CQA			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Complete Mobilization Submittals	Subcontract Award	30
2.	Submit Cell 9 Final Certification Report	Subcontract	4/01/2011

		Award	
3.	Submit Cell 10 Final Certification Report	Subcontract Award	9/01/2011
4.	Complete Demobilization	Subcontract Award	9/29/2011

CONTRACTOR will make available to the SUBCONTRACTOR the construction schedule provided by the ERDF Construction Subcontractor within 25 days after the award of ERDF Construction Subcontract. The SUBCONTRACTOR shall plan and ensure adequate resources are available in accordance with this schedule.

The following milestones were set by CONTRACTOR for the ERDF Construction Subcontract. SUBCONTRACTOR shall use these milestones only for bidding and resource planning purposes.

ERDF CELLS 9 & 10 CONSTRUCTION			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Submit Bonding and Insurance	Subcontract Award	10
2.	Complete Mobilization Submittals	Subcontract Award	30
3.	Cell 9 Excavation	Per S/C schedule	4/1/2010
4.	Admix Test Pad	Per S/C schedule	4/15/2010
5.	Complete Cell 10 North and South Embankments	Per S/C schedule	6/1/2010
6.	Cell 9 Admix Placement	Per S/C schedule	7/12/2010
7.	Cell 10 Excavation	Per S/C schedule	8/1/2010
8.	Remove Covers and Clean Existing Leachate Tanks	Per S/C schedule	8/1/2010
9.	New Covers on Existing Leachate Tanks	Per S/C schedule	10/1/2010
10.	Cell 9 Liner & Leachate Collection Systems	Per S/C schedule	10/1/2010
11.	Cell 10 Admix Placement (Admix Placement South of Sump and Admix Winter Protection)	Per S/C schedule	11/1/2010
12.	Cell 9 Operations Layer	Per S/C schedule	11/15/2010
13.	Revegetate Stockpiles	11/1/2010	12/31/2010
14.	Cell 9 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	12/1/2010
15.	Leachate Transmission Pipeline (pipeline, manholes, electrical)	Per S/C schedule	2/1/2011
16.	Leachate Tank No. 3	Per S/C schedule	2/1/2011
17.	Cell 9 Acceptance Testing	Per S/C schedule	3/1/2011
18.	Cell 10 Admix Placement (Admix Placement in Sump and North Slope & Remove Winter Protection)	Per S/C schedule	4/1/2011
19.	Cell 10 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	4/1/2011
20.	Cell 10 Liner & Leachate Collection Systems	Per S/C schedule	7/1/2011
21.	Cell 10 Operations Layer	Per S/C schedule	9/1/2011
22.	Cell 10 Acceptance Testing	Per S/C schedule	8/1/2011

23.	De-Mobilization	Per S/C schedule	9/29/2011
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4.4.2 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR to take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the Subcontract Milestones set forth above, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of work per week, expedited shipment(s) of equipment and materials, and an increase in the amount of construction plant and equipment, without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of work and rate of progress required by this Subcontract.

4.4.3 Noncompliance with CONTRACTOR'S instructions shall be grounds for CONTRACTOR'S determination that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate this Subcontract pursuant to the General Condition clause titled "TERMINATION FOR DEFAULT."

SC 4.5 SUBCONTRACT SCHEDULE

4.5.1 SUBCONTRACTOR shall, within fifteen (15) calendar days of Subcontract award, submit to CONTRACTOR for approval the Subcontract Schedule consisting of a detailed schedule meeting the milestone dates established in the Special Condition titled "COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK." This approved Subcontract schedule is the Project Baseline Schedule. No progress payments will be made until the SUBCONTRACTOR'S schedule has been accepted by the CONTRACTOR and annotated as a Status "1". The Subcontract Schedule shall be based on a critical path analysis of activities (as applicable) and sequence of operations needed for the orderly performance and completion of any separable parts of and all the Work in accordance with this Subcontract. The Subcontract Schedule shall be a resource loaded Critical Path Method (CPM) type in the form of a precedence diagram and activity listing. The schedule shall contain sufficient detail to identify critical schedule activities, CONTRACTOR interface, submittals required, inspection points, deliverables, and any other information pertinent to the performance of this Subcontract.

4.5.2 The Subcontract Schedule shall show in detail and in order of sequence, all activities, their descriptions, durations, production rate variances and dependencies, necessary and required to complete the Work, and any separable parts thereof. In addition to Milestones shown in SC 4.4.1 the following (minimum) list shall be included as specific activities:

4.5.3 The activity listing shall show the following information for each activity on the Subcontract Schedule:

1. Identification by activity numbers and descriptions
2. Craft (manpower) and equipment resource loaded activity sheets for Project Baseline Schedule
3. Early start and finish dates
4. Late start and finish dates
5. Identify any float time
6. Identify and describe any suspension of work, if applicable

4.5.4 The Subcontract Schedule shall be complete, covering activities at the Jobsite, off-site activities such as design, fabrication, procurement and jobsite delivery of SUBCONTRACTOR-furnished

equipment, and the scheduled Jobsite delivery dates of equipment to be furnished by CONTRACTOR, if any, and shall include a personnel forecast by crafts. SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans (resources, production rates, logistics/methodology, requirement for Radiological Control Technicians (RCTs), and CONTRACTOR deliverables) required for performing each separable part of Work.

- 4.5.5 The Subcontract schedule and revisions must be submitted in an electronic format compatible with Primavera Project Planner, Version 2.0 or later industry updates (WINDOWS) or as coordinated with CONTRACTOR. SUBCONTRACTOR shall promptly inform CONTRACTOR of any proposed change in the schedule and narrative and shall furnish CONTRACTOR with a revised schedule and narrative within ten (10) calendar days after approval by CONTRACTOR of such change.
- 4.5.6 The schedule and narrative shall be kept up to date, taking into account the actual Work progress and shall be revised, if necessary, every thirty (30) calendar days. The revised schedule and narrative shall, as determined by CONTRACTOR, be sufficient to meet the requirements to complete the separable parts of any and all of the Work, as set forth in this Subcontract.
- 4.5.7 During the performance of the Work, SUBCONTRACTOR shall submit to CONTRACTOR periodic progress reports in duplicate on the actual progress. Such reports shall be furnished as CONTRACTOR may request.
- 4.5.8 Such progress reports shall include the following:

- 1. Quarterly Chemical Inventory, (See Exhibit G and Exhibit J)
- 2. Monthly Accident and injury report summary, as required by Exhibit "A". General Condition titled SAFETY AND HEALTH, and Exhibit "G" Subcontractors Safety and Health Requirements, titled "Reporting Accidents and Incidents".
- 3. Monthly A copy of the Subcontract Schedule outlining progress to date for the major parts of the Work, as compared to scheduled progress, no later than the end of the month.
- 4. Monthly A comparison between planned and actual personnel by craft for Work performed to date, as required by CONTRACTOR.
- 5. Monthly A detailed and complete financial report in spreadsheet format showing as a minimum, current month. Past months, future month projections of pay item billings, percents of work complete by pay item no later than 10 working days after the end of each month.
- 6. Weekly A three-week look-ahead schedule showing forecast personnel by craft (if different from the original construction plan).
- 7. Weekly A three-week look-ahead schedule showing forecast progress of the Work, detailing discreet elements of work within each subcontract schedule activity, including forecast of personnel by craft, as required by CONTRACTOR.
- 8. Weekly A weekly report of quantities completed on items of the Work, as required by CONTRACTOR.
- 9. Weekly A weekly update of the estimate of labor hours for each activity or operation, as

required by CONTRACTOR.

10. Daily A daily force report listing all personnel by craft and Work performed by them,

SC 4.6 RESERVED

SC 4.7 SECURITY AND HAZARD COMMUNICATION PROGRAMS

- 4.7.1 A Security Program shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any event prior to commencing Work at the Jobsite. Such Program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, and shall include:

- 4.7.1.1 Controlled access to office, warehouse, material and equipment sites.
- 4.7.1.2 Accountability procedures for the requisition and issue of materials.
- 4.7.1.3 Periodic security checks for all work areas assigned to SUBCONTRACTOR.
- 4.7.1.4 Prompt reporting of incidents of loss, theft or vandalism to CONTRACTOR, subsequently detailed in writing.
- 4.7.1.5 Coordination and compliance with Site security programs.

- 4.7.2 A Hazard Communication Program shall be submitted in writing to the CONTRACTOR for approval and coordination with other jobsite activities within thirty (30) days after Subcontract award or prior to commencing work at the Jobsite. Such program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, (See Exhibit "G", Safety and Health Requirements), and shall include Identification of Hazard Communication Program responsibility and accountability. The Hazard Communication Program shall ensure:

- 4.7.2.1 Receipt and document control of Material Safety Data Sheets (MSDS) for materials being brought onto the Jobsite by the SUBCONTRACTOR or its suppliers and subtiers.
- 4.7.2.2 Employee training on MSDS's and in the handling and disposal of materials that fall under statutory regulations.
- 4.7.2.3 A disposal plan for removal of hazardous materials from the Jobsite. This plan must meet all federal/national, state and other applicable governmental requirements.

- 4.7.3 Subcontractor and all of Subcontractor's lower-tier subcontractors shall identify supervisory point(s) of contact (POCs) that will be on site whenever Subcontractor's/or lower-tier subcontractor's personnel are on site. The POC is responsible for notifying Subcontractor's personnel when an "Event Notification" occurs.

Event Notification will be broadcast on the WCH Intranet and via text messages to all POCs. The POC shall carry a cell phone at all times that is capable of sending and receiving text messages and the cell phone number shall be provided to the STR and kept up-to-date at all times.

SC 4.8 RESERVED

SC 4.9 SUBCONTRACTOR KEY PERSONNEL

- 4.9.1 CONTRACTOR reserves the right to approve all Key Personnel. SUBCONTRACTOR'S key personnel must be assigned full-time onsite to this Subcontract exclusively and possess the minimum qualifications listed below. SUBCONTRACTOR shall not reassign or remove key personnel without prior written authorization of CONTRACTOR. Whenever, for any reason, one or more of these individuals are unavailable for assignment for Work under this Subcontract, any replacement key personnel shall possess the minimum qualifications and experience required for the position.
- 4.9.2 When the CONTRACTOR finds that a correlation exists or appears to exist between a documented lack of SUBCONTRACTOR performance and a lack of SUBCONTRACTOR employee qualification performance and/or falsification of experience requirements, the SUBCONTRACTOR agrees to immediately replace that individual with another employee with the minimum qualifications appropriate to the work being performed as specified above at no additional cost to the CONTRACTOR.

CQA OFFICER

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.1 requirements.

CQA ENGINEER AND PROJECT MANAGER (FULLTIME ON SITE POSITION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.2 requirements.

BENTONITE ADMIX LANDFILL LINER CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING ADMIX PUGMILL SET UP, TEST PAD, OPERATION, AND PLACEMENT)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

GEOSYNTHETICS CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING GEOSYNTHETICS INSTALLATION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

SC 4.10 RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE

- 4.10.1 SUBCONTRACTOR shall not schedule materials and/or equipment for delivery to the Jobsite until such time as it is mobilized to receive and accept property at the Jobsite. CONTRACTOR reserves the right to require survey of any materials/equipment for presence of hazardous or radioactive substances before bringing the equipment/material into or from the Jobsite. Any deficiencies shall be corrected or replaced at SUBCONTRACTOR'S expense.
- 4.10.2 SUBCONTRACTOR is not permitted to use CONTRACTOR'S mailing address and in no case shall material or equipment be addressed in care of CONTRACTOR. It is recognized that special conditions may exist that would warrant assistance in the delivery of equipment or materials by CONTRACTOR. However, the SUBCONTRACTOR must have explicit prior written authorization from CONTRACTOR.

SC 4.11 RESERVED

5.0 THE CONTRACTOR

SC 5.1 CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS

- 5.1.1 CONTRACTOR will furnish specifications and design drawings for each part of the Work under this Subcontract. SUBCONTRACTOR shall, immediately upon receipt thereof, check all specifications and drawings furnished and shall promptly notify CONTRACTOR of any omissions or discrepancies in such specifications or drawings.
- 5.1.2 All specifications and drawings listed in Exhibit "E", SPECIFICATIONS and Exhibit "F", DRAWINGS are a part of this Subcontract. "Issued for Award" (IFA) specifications and drawings will be issued at the time of award and become a part of the Subcontract, superseding or supplementing the original drawings. SUBCONTRACTOR shall perform Work only in accordance with drawings marked IFA. If SUBCONTRACTOR considers such issue to be a change affecting cost or schedule, SUBCONTRACTOR must request an equitable adjustment in accordance with the General Condition titled "CHANGES."
- 5.1.3 SUBCONTRACTOR shall perform Work only in accordance with IFA drawings and any subsequent revisions thereto, and with CONTRACTOR reviewed drawings submitted by SUBCONTRACTOR in accordance with the Special Condition titled "SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES."
- 5.1.4 The CONTRACTOR shall maintain control of all electrical drawings. The SUBCONTRACTOR shall provide appropriate design and as-built to the CONTRACTOR for incorporation into the drawings.
- 5.1.5 One (1) copy of such specifications, and One (1) full size reproducible copy, and One (1) full size prints of such drawings will be furnished to SUBCONTRACTOR without charge. Any additional copies of such specifications and drawings will, upon SUBCONTRACTOR'S request, be furnished to SUBCONTRACTOR at the actual cost thereof.

SC 5.2 CONTRACTOR-FURNISHED UTILITIES AND SERVICES

- 5.2.1 Utilities. The utilities listed below and specifically detailed in the Specifications or Statement of Work, as applicable, will be furnished by CONTRACTOR without cost to SUBCONTRACTOR, provided that all such utilities will be furnished at outlets existing on the Jobsite and SUBCONTRACTOR shall, at its expense, extend such utilities from said outlets to points of use and at completion of all the Work remove all materials and equipment used for such extensions.
 - 5.2.1.1 Water for construction
 - 5.2.1.2 Potable water
 - 5.2.1.3 Electrical services
 - 5.2.1.4 Telecommunication lines
- 5.2.2 Services. The CONTRACTOR shall determine whether the services listed below, if required under this Subcontract, will be furnished by CONTRACTOR to support performance of Work by SUBCONTRACTOR.
 - 5.2.2.1 Services of Non-Building Trades, bargaining craft Radiological Control Technicians (RCTs) who are members of the Hanford Atomic Metals Trades Council (HAMTC) to perform radiological monitoring.

5.2.2.2 CONTRACTOR will provide Radiological Dosimetry Services and Records, and Occupational Medical Services and Records.

5.2.3 Facilities. The facilities listed below will be furnished by CONTRACTOR. Such facilities may be used by SUBCONTRACTOR without charge therefore, provided that any such use will be subject to written approval of CONTRACTOR.

5.2.3.1 Office and Laboratory Testing Trailer with the following characteristics:

- Three offices (12' x 9' minimum)
- Laboratory space (21x16 space and including shelving). Electrical outlets will be provided in each office area, hallways, and at least six 110v outlets and one 220v outlet will be provided in the laboratory area.
- Daily janitorial service (trash service, vacuuming, mopping, etc.) provided by the CONTRACTOR.
- Office/lab trailer utilities (HVAC, electrical, etc.) will be provided and maintained by CONTRACTOR.

5.2.3.2 Temporary toilet facility with separate areas for males and females.

5.2.3.1 Jobsite parking area – The CONTRACTOR will designate an area near the operation for SUBCONTRACTOR personnel vehicle parking.

SUBCONTRACTOR shall be responsible for testing equipment, office supplies (copiers, computers, consumables, internet service, telecommunications, etc.), and furniture (including flammable storage cabinets).

SC 5.3 CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT

5.3.1 CONTRACTOR will furnish to SUBCONTRACTOR, at CONTRACTOR'S warehouse or Jobsite storage area, the items listed below to be incorporated into or used in performance of the Work under this Subcontract. Such items will be furnished, without cost to SUBCONTRACTOR, provided that SUBCONTRACTOR shall, at its expense, accept delivery thereof, load, unload, transport to points of use and care for such items until final disposition thereof. At time of acceptance of any such item from CONTRACTOR, SUBCONTRACTOR shall sign a receipt therefore. Signing of such receipt without reservation therein shall preclude any subsequent claim by SUBCONTRACTOR that any such items were received from CONTRACTOR in a damaged condition and with shortages. SUBCONTRACTOR shall account for such material and equipment in accordance with FAR 52.245.1 (June 2007). If at any time after acceptance of any such item from CONTRACTOR any such item is damaged, lost, stolen, or destroyed, such item shall be repaired or replaced at the expense of SUBCONTRACTOR. Items required to be replaced may, at its option, be furnished by CONTRACTOR. Upon completion of all the Work under this Subcontract, SUBCONTRACTOR shall, at its expense, return all surplus and unused items to CONTRACTOR'S warehouse or Jobsite storage area.

5.3.2 CONTRACTOR will exert every reasonable effort to make delivery of such materials and equipment so as to avoid delay in the progress of the Work. However, should CONTRACTOR, for any reason, fail to make delivery of any such item and a delay shall result, SUBCONTRACTOR shall be entitled to no additional compensation or damages on account of such delay. The only adjustment that will be made will be the granting of an appropriate extension of time.

SC 5.4 CONTRACTOR-FURNISHED PERMITS

The General Condition titled "PERMITS AND LICENSES" notwithstanding, CONTRACTOR will without cost to the SUBCONTRACTOR; furnish the permits required for performance of work on the Hanford Site. SUBCONTRACTOR shall, in accordance with said General Condition titled "PERMITS AND LICENSES", provide all other permits. All such CONTRACTOR-furnished permits are available for examination at the project office of CONTRACTOR during regular business hours.

SC 5.5 AUTHORITY OF PERSONNEL

- 5.5.1 The CONTRACTOR will designate a Subcontract Specialist to administer the Subcontract terms and conditions and act as the CONTRACTOR'S authorized representative. Additionally, all correspondence shall be issued and received by the designated Subcontract Specialist. Unless further delegated, in writing, by the Subcontract Specialist as set forth below, the only individual authorized to direct the SUBCONTRACTOR to deviate from the express, written terms of the Subcontract is the authorized Subcontract Specialist.
- 5.5.2 The CONTRACTOR will designate a Subcontract Technical Representative (STR) who will be responsible for the technical aspects of the performance of the Subcontract. The STR may designate other personnel to oversee the performance of the Work, sign field tickets, etc. However, the designated STR retains ultimate authority over the technical aspects of the Work. Should the SUBCONTRACTOR and STR disagree over the technical requirements of the Subcontract; such matters will be immediately referred to the CONTRACTOR'S Subcontract Specialist for resolution. Subcontract Specialist may advise SUBCONTRACTOR of further delegation of his/her authority as set forth above. Unless so advised, STR does not possess authority, express or implied, to direct the SUBCONTRACTOR to deviate from the terms and conditions of the Subcontract.

SC 5.6 DISPOSITION OF CONTAMINATED PROPERTY

- 5.6.1 The SUBCONTRACTOR is expected to bring equipment that is readily decontaminated. The SUBCONTRACTOR agrees to submit to CONTRACTOR for survey any equipment, tools, or other personal property brought into any Radiological Areas by the SUBCONTRACTOR, its employees, and any of its subcontractors and their employees.
- 5.6.2 The necessary survey to detect contamination will be performed immediately before removing any property from any location within the Jobsite Controlled Access Area or area specified by the CONTRACTOR. The SUBCONTRACTOR shall notify CONTRACTOR not less than three (3) working days before each property (including equipment and tools) removal.
- 5.6.3 The CONTRACTOR'S intent is to work with the SUBCONTRACTOR to release all SUBCONTRACTOR'S equipment through the efforts of equipment placement (minimization of contact) and decontamination efforts on affected equipment pieces (i.e., buckets, tracks, beds). Because of the known inventory of constituents within the excavation areas, CONTRACTOR cannot guarantee the full release of SUBCONTRACTOR'S equipment or parts thereof.
- 5.6.4 Any equipment, except for treatment equipment designed and intended to come into direct contact with contaminated material, that cannot be decontaminated or free released (radiological) in a timely manner will not be released back to the SUBCONTRACTOR and becomes the property of the CONTRACTOR/OWNER. At the sole discretion of the CONTRACTOR, additional compensation to the SUBCONTRACTOR may be made for the contaminated equipment.

- 5.6.5 In any event, the SUBCONTRACTOR shall be responsible for all CONTRACTOR and SUBCONTRACTOR costs incurred when contamination of equipment/material results from violation of CONTRACTOR'S Radiological Control Program.
- 5.6.6 Prior to release of any equipment, SUBCONTRACTOR shall consult with CONTRACTOR to determine whether decontamination is necessary.

6.0 GENERAL SUBCONTRACT PROVISIONS

SC 6.1 WORK HOURS AND FACILITY CLOSURE DAYS

6.1.1 Site Work Hours

6.1.1.1 Site Work hours are from 6:00 a.m. to 4:30 p.m. Monday through Friday (5 days per week, 10/hours per day). SUBCONTRACTOR shall be onsite when the Construction Subcontractor is performing work requiring Construction Quality Assurance (CQA) oversight. Deviation from the approved Site work hours shall be requested in writing from the CONTRACTOR and such approval shall not be unreasonably withheld, but shall be at the Contractor's discretion. The Subcontractor should plan to observe the same facility closure days as the CONTRACTOR.

CONTRACTOR recognizes the following Facility Closure days:

- | | |
|--------------------------------|-------------------------|
| New Year's Day | Labor Day |
| *Presidents Day | Thanksgiving Day |
| Memorial Day | Day before Thanksgiving |
| Independence Day | Christmas Day |
| *Day before or after Christmas | |

*Facility closure is not applicable to Building Trades Craft
 Note: In the event a Facility Closure Day falls on a weekend (Friday, Saturday, or Sunday), it will be observed on an otherwise scheduled work day.

6.1.1.2 SUBCONTRACTOR is responsible for contacting the Subcontract Technical Representative with support requirements on Facility Closure dates with a 72-hour advance written notice to the CONTRACTOR. The SUBCONTRACTOR shall not perform any work at the jobsite on any Facility Closure Day without CONTRACTOR approval in advance.

6.1.1.3 SUBCONTRACTOR shall take into consideration that the above work schedule may be deviated from based upon the official Department of Energy, Richland Operations Office (RL) process for declaring changes to the Hanford Site work schedule due to inclement weather conditions. SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the general and local conditions, including, but not limited to, climatic conditions and seasons.

6.1.2 Notification System

There are three primary methods used to notify employees and subcontractors when site conditions necessitate a site closure, delay in the start of work, or early release from work.

6.1.2.1 Subcontractor employees may request their Subcontract Specialist or Subcontractor Technical Representative submit their name, cell phone number, and cell phone provider to the WCH text messaging notification system. In the event there are site

closures, for any reason, the recipient will receive a text message providing the information.

6.1.2.2 Subcontractor employees may refer to the WCH External Website. In the event of delays or site closures, a banner will be posted on the website.

6.1.2.3 Subcontractor employees may phone 372-9002 for emergency or site closure information.

6.1.3 Variable Conditions May Affect Site Areas Differently

6.1.3.1 Due to the size of the Hanford Site, adverse weather conditions may affect separate parts of the site differently. In these cases, the work delay/early release may only apply to those employees and/or Subcontractors working in the most affected areas. In the event a project needs an individual to be present onsite during adverse weather, CONTRACTOR shall notify SUBCONTRACTOR.

6.1.3.2 When the start of work is delayed due to inclement weather conditions, the adjusted start time is intended to give employees and/or Subcontractors adequate time to arrive at work safely. Arriving ahead of the adjusted start time could jeopardize the completion of maintenance work, and could put the employee at risk in terms of unsafe road conditions and/or unsafe walking surfaces at the work place. If a decision is made for an early release of employees and/or Subcontractors from work due to severe weather conditions, the CONTRACTOR will notify the SUBCONTRACTOR.

SC 6.2 WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL

6.2.1 Working Hours:

The SUBCONTRACTOR shall not perform Work at the Jobsite on other than the Site Work hours specified in subparagraph 6.1.1 above, unless it has given prior written notification to CONTRACTOR and has received approval in advance, as provided in this Special Condition.

6.2.2 Notification:

The SUBCONTRACTOR shall give CONTRACTOR at least four (4) hours prior notice if its employees are to be working after the site work hours specified in SC 6.1.1. The SUBCONTRACTOR shall give CONTRACTOR notice on the prior working day if its employees will be working before the site work hours specified in SC 6.1.1, or will be working at any time on Saturday, Sunday, or holidays. The notice shall include the type of Work to be performed, location of Work, date and hours of Work, and description of any heavy equipment to be used. CONTRACTOR advance approval is required any time Work is to be performed at other than normal shift periods.

SC 6.3 SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION

The Subcontract Performance Period shall commence on the date of Award of the Subcontract and extend through and including September 30, 2011.

SC 6.4 INCREMENTAL FUNDING OF SUBCONTRACT

The CONTRACTOR'S obligation to pay the Subcontract price in accordance with Section entitled, "Measurement for Payment and Payment for Work", of the Subcontract Special Conditions is subject to the provisions and limitations further set forth by the following. The CONTRACTOR'S obligation under this

Subcontract is hereby limited notwithstanding any provision of the "Measurement for Payment and Payment for Work" section or any other section or provision of this Subcontract.

- 6.4.1 Allotment of Funds: Of the total Subcontract price, only specific portions of the total amount are estimated to be available, allotted by FY, for this Subcontract. The CONTRACTOR shall not be obligated under this Subcontract to the SUBCONTRACTOR on any theory or basis for total payment in excess of total allotments up to that time. Furthermore, the SUBCONTRACTOR is not to expend any effort on Work for which the CONTRACTOR has not provided the SUBCONTRACTOR written authorization to proceed.

CONTRACTOR shall notify SUBCONTRACTOR of the estimated amount of funding to be available for each subsequent FY. It is contemplated, but not warranted, that the full amount of estimated funds for each FY's allotment will be available by October 1st, of each FY. CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the exact amount of each FY allotment of funds as soon as such becomes known.

6.4.2 Schedule:

6.4.2.1 The SUBCONTRACTOR agrees to schedule and perform or have performed the contract work in such a manner as to ensure that, in the event of termination of this contract pursuant to Subcontract General Conditions, Clause, "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) would not exceed the total amount allotted at the time to the Subcontract. The CONTRACTOR shall not be obligated in any event to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this subcontract, anything to the contrary or any other provision of this Subcontract notwithstanding.

6.4.2.2 To insure compliance with the requirements of subparagraph 6.4.2.1 above, all schedules required elsewhere in this Subcontract shall relate to and describe the SUBCONTRACTOR'S proposed plan for performance of work and representation of work actually performed to the amount then allotted to this Subcontract. Furthermore, SUBCONTRACTOR shall schedule and relate planning for future performance of Work to the estimated allotments to this Subcontract referenced in subparagraph 6.4.1, above.

- 6.4.3 Notices – Actions When Costs Approach Total Amounts Allotted: Until such time as the CONTRACTOR has allotted funds up to the full Subcontract price, including any adjustments thereto, the SUBCONTRACTOR shall notify the CONTRACTOR in writing 30 days in advance of the point when, in the event of termination of this Subcontract pursuant to the article hereof entitled "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) will approximate eighty-five percent (85%) of the total amount then allotted to the Subcontract. Upon receipt of such notice, the CONTRACTOR may take one of, or a combination of, the following actions:

6.4.3.1 Instruct the SUBCONTRACTOR to continue performance of the Subcontract to the extent permitted by the amount of funds then allocated to this Subcontract;

6.4.3.2 Increase the amount of funds allotted to the Subcontract and instruct the SUBCONTRACTOR to proceed with work not previously funded;

6.4.3.3 Order the SUBCONTRACTOR to suspend all or any part of the work in accordance with Subcontract General Conditions, "Suspension". If the suspension of work has resulted from the failure of the SUBCONTRACTOR to schedule and perform the Subcontract work in accordance with the provisions of subparagraph 6.4.2 above, the SUBCONTRACTOR shall not be entitled to an equitable adjustment in Subcontract price nor time, nor shall the costs of the suspension be allowable in any subsequent

termination of the Subcontract for the convenience of the CONTRACTOR, irrespective of the provisions of the "Suspension" article, the "Termination for Convenience" article, or any other section or provision of the Subcontract; or

- 6.4.3.4 Terminate the performance of all or part of the work under this Subcontract in accordance with the "Termination for Convenience" section; or
- 6.4.3.5 Direct the SUBCONTRACTOR to take such action, as is agreed by the parties in writing to be appropriate under the circumstances (provided such action does not exceed the total funds then allotted).
- 6.4.4 **SUBCONTRACTOR Excused From Further Performance:** Before the allotment of funds up to the total Subcontract price (including any adjustments thereto), when the SUBCONTRACTOR'S performance has reached the point at which in the event of exercise of the "Termination" section of this Subcontract, the total amount payable by the CONTRACTOR would equal 100% (one hundred percent) of the amount then allotted to this Subcontract, the SUBCONTRACTOR shall immediately notify the CONTRACTOR and shall make no further commitments or expenditures (except to meet existing commitments and liabilities). The CONTRACTOR shall not be obligated to pay the SUBCONTRACTOR an amount in excess of the total amount then allotted to the Subcontract. If additional funds are not allotted by the date set forth in subparagraph 6.4.1 above, or such later date as may be agreed to by both parties, the SUBCONTRACTOR shall not be obligated to continue performance under this Subcontract and the CONTRACTOR will, upon written request of the SUBCONTRACTOR, terminate the Subcontract pursuant to the provisions of the "Termination for Convenience" article, provided, however that in no event shall the CONTRACTOR be obligated to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this Subcontract.
- 6.4.5 If the SUBCONTRACTOR incurs additional costs or is delayed in the performance of the work under this Subcontract solely by reason of the failure of the CONTRACTOR to allot additional funds in accordance with the subparagraph 6.4.1 above, and if additional funds are allotted, equitable adjustments shall be made in Subcontract price and performance time.
- 6.4.6 The CONTRACTOR may at any time prior to termination, and with the consent of the SUBCONTRACTOR after notice of termination, allot additional funds to this Subcontract.
- 6.4.7 Nothing in this clause shall affect the right of the CONTRACTOR to terminate this Subcontract pursuant to the article of this Subcontract entitled, "Termination for the Convenience of the Government".
- 6.4.8 **Change Orders:** Changes issued pursuant to Subcontract General Conditions, "Changes", shall not be considered authorization for the SUBCONTRACTOR to exceed the amount allotted to this Subcontract in the absence of a statement in the Change Order, or other written notice to the SUBCONTRACTOR, increasing the amount allotted to this Subcontract.

SC 6.5 TECHNICAL DIRECTION

- 6.5.1 The term "technical direction" is defined as: (1) directions to the SUBCONTRACTOR, which shift work emphasis between work areas, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to facilitate the Subcontract Scope of Work; (2) provision of written information to the Subcontract that assists in the interpretation of drawings, specifications or technical portions of the work description; and (3) review and approval of technical reports, drawings, specifications, and technical information to be delivered by the SUBCONTRACTOR to the CONTRACTOR under the subcontract.
- 6.5.2 Technical direction must be within the Scope of Work stated in the subcontract. Unless so delegated, CONTRACTOR'S Subcontract Technical Representative (STR) does not have the

authority to, and may not issue any direction which: (1) constitutes an assignment outside the Scope of Work; (2) constitutes a change as defined in the Subcontract Clause, "Changes"; (3) in any manner causes an increase or decrease in the total estimated subcontract cost, the fixed unit rates, if any, or the time required for subcontract performance; and (4) changes any of the expressed terms and conditions.

6.5.3 The SUBCONTRACTOR shall proceed promptly with the performance of technical direction issued by the CONTRACTOR'S STR in the manner prescribed by this article and within the authority under the provisions of this article. If, in the opinion of the SUBCONTRACTOR, any instruction or direction by the CONTRACTOR'S STR falls within one of the categories defined in subparagraph 6.5.2 above, the SUBCONTRACTOR shall not proceed, but shall notify the Subcontract Administrator in writing within ten (10) working days after receipt of any such instruction or direction and shall request the Subcontract Administrator to modify the Subcontract accordingly.

6.5.4 A failure of the SUBCONTRACTOR and Subcontract Administrator to agree that the technical direction is within the Statement of Work or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the clause entitled, "Disputes".

SC 6.6 TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY)

Business related travel for non-represented employees is not generally authorized. In the event travel is authorized, SUBCONTRACTOR shall comply with WCH procedures. All authorized travel will be reimbursed in accordance with the Federal Travel Regulations (FTRs). Additionally, the following clauses apply:

6.6.1 En Route Expenses:

6.6.1.1 Transportation via public carrier will be reimbursed up to the equivalent of least cost economy (refundable) air fare plus actual and reasonable expenses in traveling shortest and most direct route from traveler's home office, to Richland Washington or at other such locations and return, at request of CONTRACTOR. Meals and incidental expenses (M&IE) includes meals, laundry, tips and phone calls to reserve lodging accommodations. Reimbursement for local travel is not authorized.

6.6.1.2 Subcontractor shall be reimbursed for lodging, subsistence and miscellaneous expenses incurred by SUBCONTRACTOR when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR consistent with the limits as described in the Federal Travel Regulations (FTR) set forth in 41 Code of Federal Regulations (CFR), latest supplement. This bulletin specifies expense limits for all geographical areas of the United States.

6.6.2 Automobile Rental:

Car rental expenses incurred by the subcontractor when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR for actual and reasonable cost incurred, supported by receipts.

6.6.3 Personal Automobile:

Mileage costs via the most direct route will be reimbursed at the current Government travel regulation rate. No reimbursement will be provided for a second automobile. Total costs for this mode of transportation may not exceed the total allowances that would have been provided had the employee traveled by public air carrier (including expenses to/from the airport and the lodging and M&IE per diem. Reimbursement for receipted toll charges is allowed over and above the mileage and M&IE.

6.6.4 Lodging, Meals, and Incidental Expenses:

6.6.4.1 Reimbursement for Temporary Assignment lodging, meals, and incidental expenses will be in accordance with the Lodging Plus methodology for the first thirty (30) days of assignment or until long-term lodging is obtained, whichever occurs first. After long-term lodging is obtained, or the thirty (30) day period has elapsed, the per diem allowance for lodging and meals and incidental expenses will be no more than seventy-five percent (75%) of the approved rate otherwise applicable.

6.6.4.2 Rental of a standard single apartment in the area, after long term lodging is obtained, or the 30-day period has elapsed, rent will be expensed via a Travel Expense Report. Proof of lodging, via receipts/copy of a signed lease agreement is required.

6.6.4.3 Subcontractors on single status assignments of three months or more may be granted trips home with approval, not to exceed a frequency of once every six weeks provided that a minimum of 30 days remain in the assignment. All travel shall be approved by the WCH STR based upon current work load.

Trips normally will be scheduled for weekends and will be on Subcontractor's time. Transportation and subsistence for trips home will be reimbursed subject to FTRs. If a Subcontractor elects to drive home, the amount may not exceed what the Subcontractor would have incurred for economy class round-trip airfare transportation home. Per Diem for M&IE is not paid during the "at-home" portion of a home leave. Lodging costs are not reimbursed for either the "en route" or the "at home" portion of home leave, however, lodging costs at the work location during home leave will be reimbursed if monthly rates are applicable.

6.6.5 Interruption of Per Diem:

During the per diem period, the meals/incidentals portion is forfeited in the following circumstances:

6.6.5.1 When Personal Time Off is taken in excess of two consecutive work days for reasons other than illness;

6.6.5.2 When Personal Time Off is taken for more than two consecutive days in conjunction with a weekend (e.g., Thursday, Friday, Weekend, Monday).

6.6.5.3 Any vacation period(s) taken in conjunction with travel including weekends or holidays taken in conjunction with vacation, and the periods covering return trips to the place of abode, are not reimbursable.

6.6.6 Other Provisions:

6.6.6.1 Receipts shall be provided substantiating travel expenses, lodging, rental cars, etc. Receipts are not required for meals and incidental expenses. Reimbursement for M&IE will not be made in excess of the maximum allowable daily totals.

6.6.6.2 This allowance shall be reduced on the first and last day of travel in accordance with the FTRs as follows:

Travel Duration	M&IE Reimbursement
Day of Departure	75% of Applicable M&IE Rate
Full day(s) of Travel	100% of Applicable M&IE Rate
Last Day of Travel	75% of Applicable M&IE Rate

- 6.6.6.3 Subcontractors on business travel in support of this Subcontract shall only be paid Labor Hours for travel during regular work hours. Any travel time paid in excess of 8 hours shall be paid at the regular straight time rate.

SC 6.7 INTEGRATED WORK CONTROL PROGRAM

Integrated Work Control (IWC) utilizes multi-disciplinary teamwork and worker involvement to support the identification, analysis, and mitigation of work site hazards; development of work packages; performance of work; and use of the observational approach for newly identified hazards. [10 CFR 851.21, and 22]. The work packages for construction of Cells 9 & 10 will be prepared by the Construction Subcontractor and will be developed and approved for release utilizing a graded approach based on risk and complexity of the work hazards and worker competence. [10 CFR 851.22].

The SUBCONTRACTOR's work performed within the Construction Subcontractor's work area shall be performed in accordance with the Construction Subcontractor's Integrated Work Control Program. The Integrated Work Control Program requirements are specified in Exhibit K.

SC 6.8 SAFETY INCENTIVE

6.8.1 Incentive

In addition to the need to protect the health and safety of the subcontractor's worker, the ability to maintain a safe and incident free work site ensures numerous financial benefits including a more productive work force, better relationships with the workers, lower insurance costs for subcontractors working, and few reports of incidents. The precise value of the items resulting from an accident at the site cannot be readily quantified. Therefore, the CONTRACTOR has allocated a quarterly financial incentive that allows the SUBCONTRACTOR the opportunity to earn an amount equal to Four Hundred Dollars (\$400.00) per eligible employee (computed in accordance with paragraph 6.8.3). Payment of incentive to SUBCONTRACTOR or sub-tier subcontractor employee is based on achieving zero OSHA Recordable Cases and OSHA Lost Work Day Cases (Days Away from Work, or restricted Work Days, or both), for WCH Hanford Site Work performed by SUBCONTRACTOR and SUBCONTRACTOR's sub-tier subcontractors as defined in paragraph 6.8.2 below.

6.8.2 Eligible Employees

- 6.8.2.1 Eligible SUBCONTRACTOR Employees are defined as any category of employee who works a minimum of three hundred (300) hours in any quarter for the SUBCONTRACTOR on a WCH project at the Hanford Site.
- 6.8.2.2 Eligible Sub-tier Subcontractor Employees are defined as any category of sub-tier subcontractor employee performing a minimum of three hundred (300) hours of long term field work during any calendar quarter when work is performed on a WCH Hanford Site project. Long term field work is defined a sub-tier subcontract work with a period of continuous performance in excess of six (6) months during the subcontract period of performance. The SUBCONTRACTOR will flow down the safety incentive to eligible sub-tier subcontractor employees meeting the criteria above.

6.8.3 Safety Incentive Periods and Computation

- 6.8.3.1 Initial Incentive Period – The Incentive Period will begin on the first day of the next month following the issue of approval by the CONTRACTOR for the SUBCONTRACTOR to mobilize at the Hanford Site. The first incentive payment will be pro-rated to the end of the current calendar year quarter.

6.8.3.2 Subsequent Incentive Periods – Subsequent Incentive Periods will be on a calendar quarter basis (January – March, April – June, July – September, or October – December) and continue through the end of the subcontract term. For a subcontract ending in mid-quarter, the incentive will be pro-rated based on the number of weeks completed in that quarter.

The recordable and Lost Work Day criteria and corresponding percentage of Safety Incentive earned are specified in the following table:

**Safety Performance Incentive Fee Schedule
Quarterly Safety Goals**

Safety Incident	One OSHA TRC recordable injury or illness (Medical Treatment or DART-Restricted Case)	Two OSHA TRC recordable injury or illnesses (Medical Treatment or DART-Restricted Case)	One OSHA recordable Lost Workday Case (Day Away DART-Day Away Case)	One or more OSHA TRC or DART Case(s) in each of two consecutive quarters
Reductions to Incentive Earned	Fifty percent (50%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive

Note: Failure to report an injury or accident, or the intentional and unauthorized altering of the scene of an injury or accident will result in a one hundred percent (100%) reduction of the quarterly incentive fee for two consecutive quarters.

6.8.3.3 Safety Incentive Payment – The Safety Incentive will be paid quarterly on the basis of four hundred dollars (\$400) per eligible employee per quarter to include sub-tier subcontractors as outlined above. The SUBCONTRACTOR will supply to the CONTRACTOR a listing of employees eligible to receive the incentive on a quarterly basis, which will establish the total potential amount of the incentive, subject to reductions as listed above. Subsequent to the distribution of incentive to employees in each quarter, SUBCONTRACTOR will provide to CONTRACTOR confirmation that the listed eligible employees received incentive payouts. An eligible employee is defined as a SUBCONTRACTOR employee that has worked for the SUBCONTRACTOR on a WCH project for a minimum of three hundred (300) hours in the quarter (See 6.8.2).

6.8.3.4 At SUBCONTRACTOR's discretion, a portion of the Safety Incentive may be retained for safety-related lunches, prizes, gifts, etc. for the benefit of the work force; however, it is expected that at least ninety percent (90%) will be passed along to SUBCONTRACTOR employees in the form of an equally distributed cash payout.

6.8.3.5 Where the SUBCONTRACTOR has an eligible sub-tier subcontractor, the total sub-tier subcontractor incentive amount will be based on four hundred dollars (\$400) per employee per quarter (see 6.8.2.2), minus any deductions outlined in the Safety Performance Incentive Fee Schedule. The SUBCONTRACTOR will inform the sub-tier subcontractor of the expectation to pass along at least ninety percent (90%) of the incentive to its employees in the form of equally distributed cash payouts.

EXHIBIT "B"

SPECIAL CONDITIONS

CONSTRUCTION SUBCONTRACTS

**ERDF SUPER CELLS 9 & 10 CONSTRUCTION QUALITY
ASSURANCE (CQA)**

REQUEST FOR PROPOSAL NUMBER R013213A00

**EXHIBIT B
SPECIAL CONDITIONS
CONSTRUCTION SUBCONTRACT**

WASHINGTON CLOSURE HANFORD LLC

TABLE OF CONTENTS

SC	Title	Page No.
1.0	SCOPE	1
2.0	DEFINITIONS	1
3.0	TERMS OF PAYMENT	1
SC 3.1	RESERVED	1
SC 3.2	RESERVED	1
SC 3.3	MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK	1
SC 3.4	EXPENDITURE NOTIFICATION.....	4
SC 3.5	PRICING ADJUSTMENTS	5
4.0	THE SUBCONTRACTOR.....	7
SC 4.1	POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	7
SC 4.2	Reserved	8
SC 4.3	SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES	8
SC 4.4	COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK	11
SC 4.5	SUBCONTRACT SCHEDULE.....	12
SC 4.6	Reserved	14
SC 4.7	SECURITY AND HAZARD COMMUNICATION PROGRAMS.....	14
SC 4.8	Reserved	15
SC 4.9	SUBCONTRACTOR KEY PERSONNEL	15
SC 4.10	RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE.....	16
SC 4.11	Reserved	16
5.0	THE CONTRACTOR	16
SC 5.1	CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS	16
SC 5.2	CONTRACTOR-FURNISHED UTILITIES AND SERVICES	16
SC 5.3	CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT	17
SC 5.4	CONTRACTOR-FURNISHED PERMITS	18
SC 5.5	AUTHORITY OF PERSONNEL.....	18
SC 5.6	DISPOSITION OF CONTAMINATED MATERIAL	20
6.0	GENERAL SUBCONTRACT PROVISIONS	19
SC 6.1	WORK HOURS AND FACILITY CLOSURE DAYS.....	19
SC 6.2	WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL.....	20
SC 6.3	SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION.....	20
SC 6.4	INCREMENTAL FUNDING OF SUBCONTRACT.....	21
SC 6.5	TECHNICAL DIRECTION	22
SC 6.6	TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY).....	23
SC 6.7	INTEGRATED WORK CONTROL PROGRAM.....	25
SC 6.8	SAFETY INCENTIVE.....	25

1.0 SCOPE

This Exhibit B provides Special Terms and Conditions that apply specifically to this Subcontract and SUBCONTRACTOR providing construction technical services to Washington Closure Hanford LLC.

2.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH) and all of its authorized representatives acting in their professional capacities in performance of OWNER'S Contract No. DE-AC06-05RL14655. To the extent that the CONTRACTOR is not the ultimate user of the services required herein, all rights, benefits and remedies conferred by Subcontractor shall also accrue and be available to and are for the express benefit of the OWNER for which the Services are required.

"JOBSITE" and "SITE" means the location(s) at which or for which the Services will be provided.

"OWNER" means the United States Department of Energy (DOE) / United States Government.

"WORK" and "SERVICES" means all technical and professional Services and responsibilities to be performed by the SUBCONTRACTOR as specified, stated, indicated or implied in the Master Agreement Subcontract or Job Order, including the furnishing and supervision of all technical personnel and the supply of all equipment, materials and supplies necessary or required to perform the Master Agreement Subcontract or Job Order.

"SUBCONTRACTOR" means the company, corporation, partnership, individual or other entity to which the Master Agreement Subcontract or Job Order is issued, its authorized representatives, successors, and permitted assigns.

"PROGRAM" means the performance of the requirements of Contract No. DE-AC06-05RL14655

"SUBCONTRACT TECHNICAL REPRESENTATIVE" is designated by the CONTRACTOR as the individual responsible for the technical aspects of the performance of the Subcontract.

"SUBCONTRACT SPECIALIST" is designated by the CONTRACTOR as the individual responsible for administering the Subcontract terms and conditions and who acts as CONTRACTOR's authorized representative.

3.0 TERMS OF PAYMENT

SC 3.1 RESERVED

SC 3.2 RESERVED

SC 3.3 MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK

- 3.3.1 For the purpose of arriving at agreement on the basis for progress payments for items bid as lump sum, SUBCONTRACTOR shall, within fifteen (15) calendar days after award, submit a proposed breakdown of values of the various elements of the Work comprising the lump sum item. Such submittal shall also include a proposed schedule of monthly progress payments. The proposed breakdown and payment schedule shall be correlated with the schedule and reports required by the Special Condition entitled "SUBCONTRACT SCHEDULE". Such breakdown and payment schedule shall be subject to CONTRACTOR'S approval.

- 3.3.2 Estimates shall be prepared by SUBCONTRACTOR and submitted in writing for CONTRACTOR'S approval on or about the end of each month covering the amount and value of Work satisfactorily performed by SUBCONTRACTOR up to the date of such estimate. Such estimate may be made by strict measurement, or by estimate, or partly by one method and partly by another. Estimates shall be based on cumulative total quantities of Work performed. Estimates may include materials or equipment not incorporated into the Work. The quantity of Work to be paid for under any item for which a unit price is fixed in the Subcontract shall be the amount or number, approved by CONTRACTOR, of units of Work satisfactorily completed in accordance with this Subcontract and computed in accordance with applicable measurement for payment provisions of this Subcontract.
- 3.3.3 SUBCONTRACTOR shall make all surveys necessary for determining quantities of Work to be paid for under this Subcontract. Copies of field notes, computations, and other records made by SUBCONTRACTOR to determine quantities shall be furnished to CONTRACTOR upon request. SUBCONTRACTOR shall notify CONTRACTOR before such surveys are made.
- 3.3.4 CONTRACTOR, at its discretion, may arrange to have its representative witness and verify surveys made by SUBCONTRACTOR for determining quantities of Work to be paid for under this Subcontract. Measurements and computations shall be made by such methods as CONTRACTOR may consider appropriate for the class of Work measured, and the estimate of quantities of Work completed shall be compatible with the reporting requirements required hereunder by the Special Condition titled "SUBCONTRACT SCHEDULE". The dividing limits, lines, or planes between adjacent items or classes of excavation, concrete, or other types of Work where not definitely indicated on the drawings or in the specifications shall be as determined by CONTRACTOR.
- 3.3.5 Review by CONTRACTOR of SUBCONTRACTOR'S estimate of the amount and value of the Work performed will be within ten (10) calendar days of its receipt and a copy of the estimate as approved returned to SUBCONTRACTOR. SUBCONTRACTOR shall prepare and submit to CONTRACTOR an invoice in accordance with the estimate as approved. SUBCONTRACTOR shall certify in each application for payment that there are no known outstanding mechanic's or material-men's liens and that all due and payable bills have been paid or are included in the application for payment. Such certification shall be on the CONTRACTOR furnished "Request for Payment (Construction Subcontracts)" form that may be down-loaded from www.wch-rcc.com. In addition, an Electronic Funds Transfer (EFT) form is provided to allow payments to be forwarded to the SUBCONTRACTOR'S bank account electronically. The EFT form will need to be completed by the CONTRACTOR and the CONTRACTOR'S bank. The bank needs to return the form to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attn: Accounts Payable

- 3.3.6 Reserved
- 3.3.7 CONTRACTOR may, as a condition precedent to any such payment to SUBCONTRACTOR, require SUBCONTRACTOR to submit complete waivers and releases of all claims of any person, firm, or corporation in connection with or in any way related to the performance of this Subcontract. Upon request, SUBCONTRACTOR shall also furnish acceptable evidence that such claims have been satisfied.
- 3.3.8 SUBCONTRACTOR shall submit, as required by CONTRACTOR, on a monthly basis, an accurate current and complete list of open purchase orders and subcontracts which include contact information (name and telephone number). CONTRACTOR reserves the right to use the contact information to verify prompt payment by SUBCONTRACTOR.

3.3.9 Any amounts otherwise payable under this Subcontract may be withheld, in whole or in part, if:

- (a) Any claims are filed against SUBCONTRACTOR by CONTRACTOR, OWNER or third parties, or if reasonable evidence indicates the probability of filing any such claims; or
- (b) SUBCONTRACTOR is in default of any Subcontract condition including, without limitation, the schedule, quality, and safety requirements; or
- (c) There is reasonable doubt that this Subcontract can be completed within the time specified or for the balance then unpaid; or
- (d) SUBCONTRACTOR has not submitted:
 - 1. Schedules and progress reports, as defined in the Special Condition titled "SUBCONTRACT SCHEDULE",
 - 2. Property insurance certificates, or not provided proper coverage or proof thereof,
 - 3. Its safety, security, and fire prevention plans, or
 - 4. Waivers and Releases or Waivers and Releases submitted with invalid information.
 - 5. Certified copies of payroll records required that are up to date to within two (2) weeks of the date SUBCONTRACTOR submits any invoice for payment.

3.3.10 CONTRACTOR will pay such withheld payments if SUBCONTRACTOR:

- (a) Pays, satisfies, or discharges any claim of CONTRACTOR, OWNER, or third parties against SUBCONTRACTOR arising out of or in any way connected with this Subcontract; or
- (b) Cures all defaults in the performance of this Subcontract.

3.3.11 If claims filed against SUBCONTRACTOR connected with performance under this SUBCONTRACT are not promptly removed by SUBCONTRACTOR after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may remove such claims and deduct all costs in connection with such removal from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. If the amount of such withheld payment or other monies due SUBCONTRACTOR is insufficient to meet such costs, or if any claim against SUBCONTRACTOR is discharged by CONTRACTOR after final payment is made, SUBCONTRACTOR shall promptly pay CONTRACTOR all costs incurred thereby, regardless of when such claim arose or whether such claim imposed a lien upon the Project or the real property upon which the Project is situated.

3.3.12 If CONTRACTOR is notified that SUBCONTRACTOR has failed to pay valid invoice submitted by sub-tier supplier or subcontractor in accordance with the payment terms of a valid sub-tier subcontract or purchase order for expenditures made under the scope of work of the SUBCONTRACT, SUBCONTRACTOR shall promptly pay such invoice. If invoices are not promptly paid by SUBCONTRACTOR within seven (7) days after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may pay such invoices directly to the sub-tier supplier or subcontractor and deduct all costs in connection with such payment from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. CONTRACTOR also reserves the right to require SUBCONTRACTOR to submit separate invoices for any or all sub-tier subcontractors or suppliers and to make payment to the sub-tier supplier or subcontractor on behalf of SUBCONTRACTOR.

- 3.3.13 If a lien is filed, SUBCONTRACTOR shall remove the lien, or see that it is removed or shall furnish a bond for the full amount thereof within seven (7) calendar days of notice by CONTRACTOR. SUBCONTRACTOR shall obtain for itself legally effective waivers of lien and furnish same to CONTRACTOR with each application for payment. Failure to comply with the foregoing requirements shall constitute grounds for termination of this Subcontract in accordance with the General Condition titled, 'TERMINATION FOR DEFAULT'.
- 3.3.14 Upon receipt by SUBCONTRACTOR of CONTRACTOR'S written notice of Final Acceptance of the Work under this Subcontract, SUBCONTRACTOR shall prepare an estimate in writing for CONTRACTOR's approval of the amount and value of all Work satisfactorily completed under this Subcontract. Upon CONTRACTOR's approval of such estimate, SUBCONTRACTOR shall prepare and submit its final invoice in accordance with the approved estimate. Unless otherwise specified by applicable law, CONTRACTOR shall, within sixty (60) calendar days following Final Acceptance and after submittal of such invoice, pay to SUBCONTRACTOR the amount then remaining due, provided that, SUBCONTRACTOR shall have furnished CONTRACTOR and OWNER for itself, its subcontractors, immediate and remote, and all material suppliers, vendors, laborers, and other parties acting through or under it, waivers and releases of all claims against CONTRACTOR or OWNER arising under or by virtue of this Subcontract, except such claims, if any, as may with the consent of CONTRACTOR and OWNER be specifically excepted by SUBCONTRACTOR from the operation of the release in stated amounts to be set forth therein.
- 3.3.15 No payments of invoices or portions thereof shall at any time constitute approval or acceptance of Work under this Subcontract, nor be considered to be a waiver by CONTRACTOR or OWNER of any of the terms of this Subcontract. However, title to all material and equipment for which payment has been made, whether or not the same has been incorporated in the Work, and title to all completed Work whether paid for or not, shall vest in CONTRACTOR, or OWNER as the case may be, and in any case shall not be part of SUBCONTRACTOR'S property or estate in the event SUBCONTRACTOR is adjudged bankrupt or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of SUBCONTRACTOR'S insolvency.
- 3.3.16 Invoices for monthly progress payments and final payment should be signed and submitted along with a completed and signed "Request for Payment (Construction Subcontracts)" form in one (1) original copy to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Accounts Payable
Reference: Subcontract Number: **R013213A00**

SC 3.4 EXPENDITURE NOTIFICATION

- 3.4.1 SUBCONTRACTOR shall furnish to the address below the best estimate of the total billable cost (invoiced and invoiceable) from Award of the Subcontract through the current calendar month end. This information must be submitted in writing (facsimile acceptable) no later than the 15th of each month.

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Subcontract Specialist
Dana Looney (509) 372-9499
Fax: (509) 372-9049.

3.4.2 For Work performed on a unit-rate basis, SUBCONTRACTOR shall notify the CONTRACTOR'S Subcontract Specialist in writing when SUBCONTRACTOR expects that in the next sixty (60) calendar days billable charges, when added to all previously billed charges, will exceed seventy-five percent (75%) of the estimated Subcontract value shown in Exhibit "C". Upon expending seventy-five percent (75%) of the estimated Subcontract value, SUBCONTRACTOR shall provide the CONTRACTOR'S authorized representative with weekly written summaries of billable charges, inclusive of previously billed charges.

3.4.3 The CONTRACTOR is not obligated to reimburse the SUBCONTRACTOR for billable charges in excess of the estimated Subcontract value, as modified. The SUBCONTRACTOR is not obligated to continue performance under this Subcontract once billable charges reach one hundred percent (100%) of the estimated Subcontract value, as modified.

SC 3.5 PRICING ADJUSTMENTS

When costs are a factor in any determination of a Subcontract adjustment pursuant to the General Condition titled, "CHANGES", or any other provision of this Subcontract unless excluded therein, such direct and indirect costs, upward or downward, for labor, equipment, and material necessary to perform the Work of the Change shall be determined in accordance with the following:

3.5.1 Determination of direct labor hours for changes involving added or deleted work shall be as follows:

- (a) For work performed in work areas outside of radiologically contaminated areas, direct labor hours necessary to perform the Work or the Change shall be established by applying standards from the most recent edition of *Building Construction Cost Data (Means)*, published by R. S. Means Company, Inc.; or other CONTRACTOR-approved data-base, as may have been previously developed by SUBCONTRACTOR.
- (b) For work performed in a radiologically or hazardous waste site exclusion zone contaminated area, the same shall apply except that the direct labor hours shall be modified by a multiplier production factor as detailed in the table below. Multiplier Factors are a maximum value and CONTRACTOR reserves the right to adjust these factors downward should site environmental conditions warrant such an adjustment.

Level of Personal Protection Required (Ref. 29 CFR 1910.120)	Multiplier Factor
A	3.62
B	
C	

- (c) In addition to direct payroll costs, direct labor costs shall include payroll taxes and insurance, vacation allowance, subsistence, travel allowance, overtime premium and any other payroll additives required to be paid by SUBCONTRACTOR by law or labor agreement(s) (e.g., Department of Labor Wage Determination, bargaining agreements such as the Hanford Site Stabilization Agreement, etc.). Note: When using Multiplier Factors of preceding paragraph (b), care must be taken to assure that the factor is applied only once to the direct labor hours.
- (d) Charges for labor furnished and used by SUBCONTRACTOR shall include all manual classifications up to and including foremen. Labor rates used to calculate the costs shall be those rates in effect during accomplishment of the change. Charges shall not be included for superintendents, assistant superintendents, general foremen, surveyors,

office personnel, timekeepers and maintenance mechanics. These charges will be included in the indirect rate as set forth below.

3.5.2 Determination of direct costs of equipment for changes involving added or deleted work shall be as follows:

(a) Allowable equipment costs of in-use or stand-by SUBCONTRACTOR-owned equipment will be computed by utilizing eighty percent (80%) of the rates set forth in the most current *Rental Rate Blue Book for Construction Equipment* (hereinafter referred to as the Blue Book), found at www.equipmentwatch.com, as adjusted for age of equipment in Region "F" provided such rates exclude unallowable or unacceptable costs in accordance with FAR 31.105. Hourly rates will be developed by using monthly rates divided by 166.7 hours based on a 4 day/10 hour per day work schedule...

1. In-use or operating equipment rates will be developed by calculating the depreciation, major overhaul, and cost of facilities capital (CFC) portion of the Blue Book rates. Blue Book indirect costs will not be allowed (they should be included as indirect rates as set forth below). The estimated operating cost per hour for consumables, including, but not limited to, maintenance labor and parts, fuel, oil, filters, lubricants, and tires will be allowed.
2. Stand-by equipment rates will be developed by calculating the CFC portion and one-half the depreciation portion of the Blue Book rate element table allowance. Blue Book indirect costs and major overhaul costs will not be allowed. The estimated operating cost per hour for consumables, including but not necessarily limited to, maintenance labor and parts; fuel, oil, filters, lubricants, and tires can not be included.

(b) Equipment costs of in-use or stand-by SUBCONTRACTOR-rented equipment shall be computed as follows: CONTRACTOR shall develop "market rates" commensurate with rates from equipment rental firms for similar equipment within the area. Should SUBCONTRACTOR-proposed rates not be comparative, CONTRACTOR reserves the right to delete unreasonable charges.

(c) When the equipment is operated infrequent and such equipment need not remain at the site of the Work continuously, as determined by the CONTRACTOR, charges shall be limited to actual hours of use. Equipment not operating, but retained at the jobsite at CONTRACTOR'S direction, shall be charged at the standby rate.

3.5.3 Direct costs of materials for changes involving added or deleted work shall be determined in the following ways:

- (a) From published supplier pricing data or written quotes from suppliers on specific items where published pricing data is not generally available (invoices from suppliers are acceptable); or
- (b) From standards published in Means, or other CONTRACTOR-approved data previously developed by SUBCONTRACTOR if information identified in paragraph (a) above is not available.

3.5.4 When pricing adjustments, the following are considered to be included as indirect costs, and as such may not be considered, and will not be compensated, as direct costs. Jobsite office expenses, incidental job burdens, small tools, general office overhead allocation, and costs for estimating the price of changed work.

3.5.5 The following shall apply to determine the indirect cost portion of Subcontract Price adjustments. CONTRACTOR recognizes Washington State business and occupation (B&O) tax rate of RCW 82.04.263 (currently 0.471 percent) as applicable to price adjustments to this Subcontract. Paragraphs (a), (b), and (c) below will apply when the adjustment does not meet the criteria for submittal of Certified Cost and Pricing data. **It must be emphasized that indirect rates in the paragraph (b) and (c) below are maximum rates and CONTRACTOR reserves the right to negotiate the indirect expense rates within the ceiling limitations.**

- (a) SUBCONTRACTOR'S and lower-tier subcontractor's overhead and profit shall be considered to include the following: insurance cost; small tools having a purchase price of \$500.00 or less; incidental job burdens; general home office expenses commonly known as G&A; labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics, as well as any other items specified for Overhead and Operations in Exhibit C. Unless otherwise stated, no separate allowance will be made and costs of premium adjustments, consequent upon changes ordered, for Payment and Performance Bonds (allowable for SUBCONTRACTOR only). Note labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics are included in overhead & profit when the change notice occurs in the timeframe of the subcontract baseline schedule. If the change notice takes place outside the baseline schedule (i.e. added scope) then direct labor charges for these types of personnel are allowed.
- (b) Overhead and Profit allowance for SUBCONTRACTOR or lower-tier subcontractors on work performed by lower-tier subcontractors shall be calculated as follows: a maximum mark-up of ten percent (10%) shall be applied to the aggregate of sub-tier subcontractor charges less than or equal to \$25,000; a maximum mark-up of seven and one-half percent (7 ½%) shall be applied to the aggregate of sub-tier subcontractor charges greater than \$25,000 but less than or equal to \$650,000; a maximum mark-up of five percent (5%) or \$100,000, whichever is less shall be applied to the aggregate of sub-tier subcontractor charges greater than \$650,000.
- (c) For parties performing the Work, overhead and profit on changes shall be calculated not to exceed the following: ten percent (10%) overhead and ten percent (10%) profit on total direct costs up to \$25,000; seven and one-half percent (7 ½%) overhead and seven and one-half percent (7 ½%) profit on total direct costs over \$25,000.00, but less than \$650,000; five percent (5%) of total direct costs or \$100,000 whichever is less, for overhead and profit combined on total direct costs over \$650,000.
- (d) Overhead and profit shall be calculated utilizing the net increase in price of the change after deductions have been taken.
- (e) Credit for overhead and profit shall be included as part of the downward adjustment for a deductive change.

3.5.6 Any change in excess of \$650,000 will require cost and pricing data as part of the proposal for the change.

4.0 THE SUBCONTRACTOR

SC 4.1 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

4.1.1 Within ten (10) working days of Subcontract execution and prior to commencement of any Work, SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.

4.1.2 Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the Work.

SC 4.2 RESERVED

SC 4.3 SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES

4.3.1 SUBCONTRACTOR shall submit drawings, data, samples, and other submittals in accordance with Exhibit "I", "Subcontractor Submittal Requirements Summary," of this Subcontract. CONTRACTOR will require a fourteen (14) calendar day review period for drawings, data, samples, and other submittals.

4.3.2 Review and permission to proceed by CONTRACTOR, as stated in this Special Condition, does not constitute acceptance or approval of design details, calculations, analyses, test methods, certificates, or materials developed or selected by SUBCONTRACTOR and does not relieve SUBCONTRACTOR from full compliance with contractual obligations. Drawing categories and their associated requirements include, but are not limited to, the following:

4.3.2.1 Issued for Construction (IFC) Drawings may be required for:

- Fabrication of SUBCONTRACTOR-furnished equipment,
- Installing SUBCONTRACTOR-furnished material or equipment,
- Planning and performance of the Work under this Subcontract
- Installing energized utility systems.

IFC drawings shall be prepared by the SUBCONTRACTOR in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." The drawings shall be submitted by and at the expense of SUBCONTRACTOR before fabrication, installation, or performance is commenced, allowing at least fourteen (14) calendar days for review by CONTRACTOR unless otherwise shown on the Subcontract Schedule. IFC drawings submitted by the SUBCONTRACTOR and reviewed by CONTRACTOR shall form a part of this Subcontract. Such drawings shall include, but not be limited to, matchmarks, erection diagrams, and other details, such as field connections for proper installation, erection of the equipment, and performance of the Work.

Drawings submitted by SUBCONTRACTOR shall be certified by SUBCONTRACTOR to be correct, shall show the Subcontract number, and shall be furnished in accordance with the Subcontract Submittal Requirements Summary (SSRS) form(s).

Design changes to the IFC drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.2 Samples:

Samples, if required, shall be submitted by and at the expense of SUBCONTRACTOR. Such submittals shall be made not less than thirty (30) calendar days before the time that the materials represented by such samples are needed for incorporation into the Work. Samples shall be subject to review and materials represented by such samples shall not be manufactured, delivered to the Jobsite, or incorporated into the Work without such review.

Each sample shall bare a label showing SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, brand name, model number, supplier's name, and reference to the appropriate drawing number, technical specification section and paragraph number, as applicable.

Samples that have been reviewed may, at CONTRACTOR'S option, be returned to SUBCONTRACTOR for incorporation into the Work.

4.3.2.3 Data and Certificates:

Four (4) copies of each required certificate shall be submitted by and at the expense of SUBCONTRACTOR. Such submittal shall be made not less than thirty (30) calendar days before the time that the materials represented by such certificates are needed for incorporation into the work. Certificates shall be subject to review, and material represented by such certificates shall not be fabricated, delivered to the jobsite, or incorporated into the Work without such review.

Certificates shall clearly identify the material being certified and shall include, but not be limited to, providing the following information: SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, and reference to the appropriate drawing, technical specification selection and paragraph number, as applicable.

4.3.2.4 Working Drawings and Design Changes:

During construction, the SUBCONTRACTOR shall keep an up-to-date set of working drawings on the jobsite as an accurate record of deviations between Work as shown on the IFC drawings and Work as installed. These drawings shall be available to CONTRACTOR and OWNER for inspection. The working drawings, including any initial as-built drawings, shall be available for inspection at the SUBCONTRACTOR's field office at the jobsite.

Design changes to the IFC drawings, including the redlining process, shall be made in accordance with the Technical Specification 000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.5 As-Built Drawings:

The SUBCONTRACTOR shall provide the as-built information submittals as described below and as detailed in Exhibit I.

4.3.2.5.1 Required Submittals. The SUBCONTRACTOR shall, at its expense, furnish to the CONTRACTOR the following submittals:

- Initial as-built drawings for energized utility systems. Drawings shall show the energized utility system configuration at the time it was placed into service.
- Final as-built drawings for all IFC and initial as-built drawing.

The content, level of detail, accuracy of location and format of the as-built drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." Design change process for initial as-built and final as-built drawings shall be in accordance with Technical Specification 0000X-SP-X0001.

4.3.2.5.2 Submittal Schedule. SUBCONTRACTOR shall furnish the as-built drawing submittals in accordance with the schedule below:

- Initial as-built drawing for electrical utility systems – Due not later than thirty (30) calendar days after final energization of the system.
- Initial as-built drawings for non-electrical utility systems – Due not later than thirty (30) calendar days after installation is complete. CONTRACTOR approval of the as-built submittal is required prior to using the non-electrical utility.
- Final as-built drawings for all work including energized utility systems due not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment.

4.3.2.6 As-Built Specifications:

SUBCONTRACTOR shall, at its expense and not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment, furnish to CONTRACTOR a complete set of marked-up, final as-built specifications with FINAL AS-BUILT clearly printed on the cover and associated electronic file. SUBCONTRACTOR shall accurately and neatly transfer all annotations from progress as-builts to final as-builts.

Deviations from specifications must be supported by Request for Information (RFI), Supplier Deviation Disposition Request (SDDR), or Design Change Notice (DCN).

4.3.2.7 Electronic Files:

As-built drawings submittals shall be prepared using acceptable and compatible software as determined by the CONTRACTOR. Submittal documents shall be delivered in the quantities as specified in Exhibit I and accompanied by an electronic media version.

4.3.2.7.1 Specifications: Textual material shall be converted to Microsoft Word and shall have a ".doc" extension.

4.3.2.7.2 Drawings: Design drawings shall be prepared by SUBCONTRACTOR in accordance with Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.8 Energized Systems:

Energized systems include, but are not limited to, the following:

- Electric Power and Control Systems (except telephone and computer systems)
- Pressurized piping systems
- Sanitary and process sewer systems

The SUBCONTRACTOR shall submit approved design and "as-built" information for energized systems (including detailed routing of above and below grade components) to the WCH Project Engineer as described above in the titled section "As-built Drawings." For electrical utility installations, the SUBCONTRACTOR shall have a "Hold Point" clearly stated in their work procedures/instructions requiring an NEC Inspection prior to final energizing of the affected system(s). The SUBCONTRACTOR shall have the current up-to-date working drawings for the system available for the NEC inspector's

use. The final energization inspection shall only be undertaken by the NEC inspector if the working drawings are current and correctly show the configuration of the work to be inspected.

SC 4.4 COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK

4.4.1 SUBCONTRACTOR shall complete the Work under the Subcontract to meet the following Subcontract Milestones measured in calendar days from Notice to Proceed (NTP) with on-site Work of the Subcontract:

ERDF CELLS 9 & 10 CQA			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Complete Mobilization Submittals	Subcontract Award	30
2.	Submit Cell 9 Final Certification Report	Subcontract Award	4/01/2011
3.	Submit Cell 10 Final Certification Report	Subcontract Award	9/01/2011
4.	Complete Demobilization	Subcontract Award	9/29/2011

CONTRACTOR will make available to the SUBCONTRACTOR the construction schedule provided by the ERDF Construction Subcontractor within 25 days after the award of ERDF Construction Subcontract. The SUBCONTRACTOR shall plan and ensure adequate resources are available in accordance with this schedule.

The following milestones were set by CONTRACTOR for the ERDF Construction Subcontract. SUBCONTRACTOR shall use these milestones only for bidding and resource planning purposes.

ERDF CELLS 9 & 10 CONSTRUCTION			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Submit Bonding and Insurance	Subcontract Award	10
2.	Complete Mobilization Submittals	Subcontract Award	30
3.	Cell 9 Excavation	Per S/C schedule	4/1/2010
4.	Admix Test Pad	Per S/C schedule	4/15/2010
5.	Complete Cell 10 North and South Embankments	Per S/C schedule	6/1/2010
6.	Cell 9 Admix Placement	Per S/C schedule	7/12/2010
7.	Cell 10 Excavation	Per S/C schedule	8/1/2010
8.	Remove Covers and Clean Existing Leachate Tanks	Per S/C schedule	8/1/2010
9.	New Covers on Existing Leachate Tanks	Per S/C schedule	10/1/2010
10.	Cell 9 Liner & Leachate Collection Systems	Per S/C schedule	10/1/2010

11.	Cell 10 Admix Placement (Admix Placement South of Sump and Admix Winter Protection)	Per S/C schedule	11/1/2010
12.	Cell 9 Operations Layer	Per S/C schedule	11/15/2010
13.	Revegetate Stockpiles	11/1/2010	12/31/2010
14.	Cell 9 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	12/1/2010
15.	Leachate Transmission Pipeline (pipeline, manholes, electrical)	Per S/C schedule	2/1/2011
16.	Leachate Tank No. 3	Per S/C schedule	2/1/2011
17.	Cell 9 Acceptance Testing	Per S/C schedule	3/1/2011
18.	Cell 10 Admix Placement (Admix Placement in Sump and North Slope & Remove Winter Protection)	Per S/C schedule	4/1/2011
19.	Cell 10 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	4/1/2011
20.	Cell 10 Liner & Leachate Collection Systems	Per S/C schedule	7/1/2011
21.	Cell 10 Operations Layer	Per S/C schedule	9/1/2011
22.	Cell 10 Acceptance Testing	Per S/C schedule	8/1/2011
23.	De-Mobilization	Per S/C schedule	9/29/2011

4.4.2 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR to take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the Subcontract Milestones set forth above, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of work per week, expedited shipment(s) of equipment and materials, and an increase in the amount of construction plant and equipment, without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of work and rate of progress required by this Subcontract.

4.4.3 Noncompliance with CONTRACTOR'S instructions shall be grounds for CONTRACTOR'S determination that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate this Subcontract pursuant to the General Condition clause titled "TERMINATION FOR DEFAULT."

SC 4.5 SUBCONTRACT SCHEDULE

4.5.1 SUBCONTRACTOR shall, within fifteen (15) calendar days of Subcontract award, submit to CONTRACTOR for approval the Subcontract Schedule consisting of a detailed schedule meeting the milestone dates established in the Special Condition titled "COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK." This approved Subcontract schedule is the Project Baseline Schedule. No progress payments will be made until the SUBCONTRACTOR'S schedule has been accepted by the CONTRACTOR and annotated as a Status "1". The Subcontract Schedule shall be based on a critical path analysis of activities (as applicable) and sequence of operations needed for the orderly performance and completion of any separable parts of and all the Work in accordance with this Subcontract. The Subcontract Schedule shall be a resource loaded Critical Path Method (CPM) type in the form of a precedence diagram and activity listing. The schedule shall contain sufficient detail to identify critical schedule activities, CONTRACTOR interface, submittals required, inspection points, deliverables, and any other information pertinent to the performance of this Subcontract.

- 4.5.2 The Subcontract Schedule shall show in detail and in order of sequence, all activities, their descriptions, durations, production rate variances and dependencies, necessary and required to complete the Work, and any separable parts thereof. In addition to Milestones shown in SC 4.4, the following (minimum) list shall be included as specific activities:
- 4.5.3 The activity listing shall show the following information for each activity on the Subcontract Schedule:
1. Identification by activity numbers and descriptions
 2. Craft (manpower) and equipment resource loaded activity sheets for Project Baseline Schedule
 3. Early start and finish dates
 4. Late start and finish dates
 5. Identify any float time
 6. Identify and describe any suspension of work, if applicable
- 4.5.4 The Subcontract Schedule shall be complete, covering activities at the Jobsite, off-site activities such as design, fabrication, procurement and jobsite delivery of SUBCONTRACTOR-furnished equipment, and the scheduled Jobsite delivery dates of equipment to be furnished by CONTRACTOR, if any, and shall include a personnel forecast by crafts. SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans (resources, production rates, logistics/methodology, requirement for Radiological Control Technicians (RCTs), and CONTRACTOR deliverables) required for performing each separable part of Work.
- 4.5.5 The Subcontract schedule and revisions must be submitted in an electronic format compatible with Primavera Project Planner, Version 2.0 or later industry updates (WINDOWS) or as coordinated with CONTRACTOR. SUBCONTRACTOR shall promptly inform CONTRACTOR of any proposed change in the schedule and narrative and shall furnish CONTRACTOR with a revised schedule and narrative within ten (10) calendar days after approval by CONTRACTOR of such change.
- 4.5.6 The schedule and narrative shall be kept up to date, taking into account the actual Work progress and shall be revised, if necessary, every thirty (30) calendar days. The revised schedule and narrative shall, as determined by CONTRACTOR, be sufficient to meet the requirements to complete the separable parts of any and all of the Work, as set forth in this Subcontract.
- 4.5.7 During the performance of the Work, SUBCONTRACTOR shall submit to CONTRACTOR periodic progress reports in duplicate on the actual progress. Such reports shall be furnished as CONTRACTOR may request.
- 4.5.8 Such progress reports shall include the following:
1. Quarterly Chemical Inventory, (See Exhibit G and Exhibit J)
 2. Monthly Accident and injury report summary, as required by Exhibit "A". General Condition titled SAFETY AND HEALTH, and Exhibit "G" Subcontractors Safety and Health Requirements, titled "Reporting Accidents and Incidents".
 3. Monthly A copy of the Subcontract Schedule outlining progress to date for the major parts of the Work, as compared to scheduled progress, no later than the end of the month.
 4. Monthly A comparison between planned and actual personnel by craft for Work

performed to date, as required by CONTRACTOR.

5. Monthly A detailed and complete financial report in spreadsheet format showing as a minimum, current month. Past months, future month projections of pay item billings, percents of work complete by pay item no later than 10 working days after the end of each month.
6. Weekly A three-week look-ahead schedule showing forecast personnel by craft (if different from the original construction plan).
7. Weekly A three-week look-ahead schedule showing forecast progress of the Work, detailing discreet elements of work within each subcontract schedule activity, including forecast of personnel by craft, as required by CONTRACTOR.
8. Weekly A weekly report of quantities completed on items of the Work, as required by CONTRACTOR.
9. Weekly A weekly update of the estimate of labor hours for each activity or operation, as required by CONTRACTOR.
10. Daily A daily force report listing all personnel by craft and Work performed by them,

SC 4.6 RESERVED

SC 4.7 SECURITY AND HAZARD COMMUNICATION PROGRAMS

4.7.1 A Security Program shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any event prior to commencing Work at the Jobsite. Such Program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, and shall include:

- 4.7.1.1. Controlled access to office, warehouse, material and equipment sites.
- 4.7.1.2. Accountability procedures for the requisition and issue of materials.
- 4.7.1.3. Periodic security checks for all work areas assigned to SUBCONTRACTOR.
- 4.7.1.4. Prompt reporting of incidents of loss, theft or vandalism to CONTRACTOR, subsequently detailed in writing.
- 4.7.1.5. Coordination and compliance with Site security programs.

4.7.2 A Hazard Communication Program shall be submitted in writing to the CONTRACTOR for approval and coordination with other jobsite activities within thirty (30) days after Subcontract award or prior to commencing work at the Jobsite. Such program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, (See Exhibit "G", Safety and Health Requirements), and shall include Identification of Hazard Communication Program responsibility and accountability. The Hazard Communication Program shall ensure:

- 4.7.2.1 Receipt and document control of Material Safety Data Sheets (MSDS for materials being brought onto the Jobsite by the SUBCONTRACTOR or its suppliers and subtiers.

- 4.7.2.2 Employee training on MSDS's and in the handling and disposal of materials that fall under statutory regulations.
- 4.7.2.3 A disposal plan for removal of hazardous materials from the Jobsite. This plan must meet all federal/national, state and other applicable governmental requirements.
- 4.7.3 Subcontractor and all of Subcontractor's lower-tier subcontractors shall identify supervisory point(s) of contact (POCs) that will be on site whenever Subcontractor's/subcontractor's personnel are on site. The POC is responsible for notifying Subcontractor's personnel when an "Event Notification" occurs.

Event Notification will be broadcast on the WCH Intranet and via text messages to all POCs. The POC shall carry a cell phone at all times that is capable of sending and receiving text messages and the cell phone number shall be provided to the STR and kept up-to-date at all times.

SC 4.8 RESERVED

SC 4.9 SUBCONTRACTOR KEY PERSONNEL

- 4.9.1 CONTRACTOR reserves the right to approve all Key Personnel. SUBCONTRACTOR'S key personnel must be assigned full-time onsite to this Subcontract exclusively and possess the minimum qualifications listed below. SUBCONTRACTOR shall not reassign or remove key personnel without prior written authorization of CONTRACTOR. Whenever, for any reason, one or more of these individuals are unavailable for assignment for Work under this Subcontract, any replacement key personnel shall possess the minimum qualifications and experience required for the position.
- 4.9.2 When the CONTRACTOR finds that a correlation exists or appears to exist between a documented lack of SUBCONTRACTOR performance and a lack of SUBCONTRACTOR employee qualification performance and/or falsification of experience requirements, the SUBCONTRACTOR agrees to immediately replace that individual with another employee with the minimum qualifications appropriate to the work being performed as specified above at no additional cost to the CONTRACTOR.

CQA OFFICER

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.1 requirements.

CQA ENGINEER AND PROJECT MANAGER (FULLTIME ON SITE POSITION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.2 requirements.

**BENTONITE ADMIX LANDFILL LINER CQA TECHNICIAN
(FULLTIME ON SITE POSITION DURING ADMIX PUGMILL SET UP, TEST PAD, OPERATION,
AND PLACEMENT)**

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

**GEOSYNTHETICS CQA TECHNICIAN
(FULLTIME ON SITE POSITION DURING GEOSYNTHETICS INSTALLATION)**

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

SC 4.10 RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE

- 4.10.1 SUBCONTRACTOR shall not schedule materials and/or equipment for delivery to the Jobsite until such time as it is mobilized to receive and accept property at the Jobsite. CONTRACTOR reserves the right to require survey of any materials/equipment for presence of hazardous or radioactive substances before bringing the equipment/material into or from the Jobsite. Any deficiencies shall be corrected or replaced at SUBCONTRACTOR'S expense.
- 4.10.2 SUBCONTRACTOR is not permitted to use CONTRACTOR'S mailing address and in no case shall material or equipment be addressed in care of CONTRACTOR. It is recognized that special conditions may exist that would warrant assistance in the delivery of equipment or materials by CONTRACTOR. However, the SUBCONTRACTOR must have explicit prior written authorization from CONTRACTOR.

SC 4.11 RESERVED

5.0 THE CONTRACTOR

SC 5.1 CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS

- 5.1.1 CONTRACTOR will furnish specifications and design drawings for each part of the Work under this Subcontract. SUBCONTRACTOR shall, immediately upon receipt thereof, check all specifications and drawings furnished and shall promptly notify CONTRACTOR of any omissions or discrepancies in such specifications or drawings.
- 5.1.2 All specifications and drawings listed in Exhibit "E", SPECIFICATIONS and Exhibit "F", DRAWINGS are a part of this Subcontract. "Issued for Award" (IFA) specifications and drawings will be issued at the time of award and become a part of the Subcontract, superseding or supplementing the original drawings. SUBCONTRACTOR shall perform Work only in accordance with drawings marked IFA. If SUBCONTRACTOR considers such issue to be a change affecting cost or schedule, SUBCONTRACTOR must request an equitable adjustment in accordance with the General Condition titled "CHANGES."
- 5.1.3 SUBCONTRACTOR shall perform Work only in accordance with IFA drawings and any subsequent revisions thereto, and with CONTRACTOR reviewed drawings submitted by SUBCONTRACTOR in accordance with the Special Condition titled "SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES."
- 5.1.4 The CONTRACTOR shall maintain control of all electrical drawings. The SUBCONTRACTOR shall provide appropriate design and as-built to the CONTRACTOR for incorporation into the drawings.
- 5.1.5 One (1) copy of such specifications, and One (1) full size reproducible copy, and One (1) full size prints of such drawings will be furnished to SUBCONTRACTOR without charge. Any additional copies of such specifications and drawings will, upon SUBCONTRACTOR'S request, be furnished to SUBCONTRACTOR at the actual cost thereof.

SC 5.2 CONTRACTOR-FURNISHED UTILITIES AND SERVICES

- 5.2.1 Utilities. The utilities listed below and specifically detailed in the Specifications or Statement of Work, as applicable, will be furnished by CONTRACTOR without cost to SUBCONTRACTOR, provided that all such utilities will be furnished at outlets existing on the Jobsite and

SUBCONTRACTOR shall, at its expense, extend such utilities from said outlets to points of use and at completion of all the Work remove all materials and equipment used for such extensions.

- 5.2.1.1 Water for construction
- 5.2.1.2 Potable water
- 5.2.1.3 Electrical services
- 5.2.1.4 Telecommunication lines

5.2.2 Services. The CONTRACTOR shall determine whether the services listed below, if required under this Subcontract, will be furnished by CONTRACTOR to support performance of Work by SUBCONTRACTOR.

5.2.2.1 Services of Non-Building Trades, bargaining craft Radiological Control Technicians (RCTs) who are members of the Hanford Atomic Metals Trades Council (HAMTC) to perform radiological monitoring.

5.2.2.2 CONTRACTOR will provide Radiological Dosimetry Services and Records, and Occupational Medical Services and Records.

5.2.3 Facilities. The facilities listed below will be furnished by CONTRACTOR. Such facilities may be used by SUBCONTRACTOR without charge therefore, provided that any such use will be subject to written approval of CONTRACTOR.

5.2.3.1 Office and Laboratory Testing Trailer with the following characteristics:

- Three offices (12' x 9' minimum)
- Laboratory space (21x16 space and including shelving). Electrical outlets will be provided in each office area, hallways, and at least six 110v outlets and one 220v outlet will be provided in the laboratory area.
- Daily janitorial service (trash service, vacuuming, mopping, etc.) provided by the CONTRACTOR.
- Office/lab trailer utilities (HVAC, electrical, etc.) will be provided and maintained by CONTRACTOR.

5.2.3.2 Temporary toilet facility with separate areas for males and females.

5.2.3.1 Jobsite parking area – The CONTRACTOR will designate an area near the operation for SUBCONTRACTOR personnel vehicle parking.

SUBCONTRACTOR shall be responsible for testing equipment, office supplies (copiers, computers, consumables, internet service, telecommunications, etc.), and furniture (including flammable storage cabinets).

SC 5.3 CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT

5.3.1 CONTRACTOR will furnish to SUBCONTRACTOR, at CONTRACTOR'S warehouse or Jobsite storage area, the items listed below to be incorporated into or used in performance of the Work under this Subcontract. Such items will be furnished, without cost to SUBCONTRACTOR, provided that SUBCONTRACTOR shall, at its expense, accept delivery thereof, load, unload, transport to points of use and care for such items until final disposition thereof. At time of acceptance of any such item from CONTRACTOR, SUBCONTRACTOR shall sign a receipt therefore. Signing of such receipt without reservation therein shall preclude any subsequent claim by SUBCONTRACTOR that any such items were received from CONTRACTOR in a

damaged condition and with shortages. SUBCONTRACTOR shall account for such material and equipment in accordance with FAR 52.245.1 (June 2007). If at any time after acceptance of any such item from CONTRACTOR any such item is damaged, lost, stolen, or destroyed, such item shall be repaired or replaced at the expense of SUBCONTRACTOR. Items required to be replaced may, at its option, be furnished by CONTRACTOR. Upon completion of all the Work under this Subcontract, SUBCONTRACTOR shall, at its expense, return all surplus and unused items to CONTRACTOR'S warehouse or Jobsite storage area.

- 5.3.2 CONTRACTOR will exert every reasonable effort to make delivery of such materials and equipment so as to avoid delay in the progress of the Work. However, should CONTRACTOR, for any reason, fail to make delivery of any such item and a delay shall result, SUBCONTRACTOR shall be entitled to no additional compensation or damages on account of such delay. The only adjustment that will be made will be the granting of an appropriate extension of time.

SC 5.4 CONTRACTOR-FURNISHED PERMITS

The General Condition titled "PERMITS AND LICENSES" notwithstanding, CONTRACTOR will without cost to the SUBCONTRACTOR; furnish the permits required for performance of work on the Hanford Site. SUBCONTRACTOR shall, in accordance with said General Condition titled "PERMITS AND LICENSES", provide all other permits. All such CONTRACTOR-furnished permits are available for examination at the project office of CONTRACTOR during regular business hours.

SC 5.5 AUTHORITY OF PERSONNEL

- 5.5.1 The CONTRACTOR will designate a Subcontract Specialist to administer the Subcontract terms and conditions and act as the CONTRACTOR'S authorized representative. Additionally, all correspondence shall be issued and received by the designated Subcontract Specialist. Unless further delegated, in writing, by the Subcontract Specialist as set forth below, the only individual authorized to direct the SUBCONTRACTOR to deviate from the express, written terms of the Subcontract is the authorized Subcontract Specialist.
- 5.5.2 The CONTRACTOR will designate a Subcontract Technical Representative (STR) who will be responsible for the technical aspects of the performance of the Subcontract. The STR may designate other personnel to oversee the performance of the Work, sign field tickets, etc. However, the designated STR retains ultimate authority over the technical aspects of the Work. Should the SUBCONTRACTOR and STR disagree over the technical requirements of the Subcontract; such matters will be immediately referred to the CONTRACTOR'S Subcontract Specialist for resolution. Subcontract Specialist may advise SUBCONTRACTOR of further delegation of his/her authority as set forth above. Unless so advised, STR does not possess authority, express or implied, to direct the SUBCONTRACTOR to deviate from the terms and conditions of the Subcontract.

SC 5.6 Disposition of Contaminated Property

- 5.6.1 The SUBCONTRACTOR is expected to bring equipment that is readily decontaminated. The SUBCONTRACTOR agrees to submit to CONTRACTOR for survey any equipment, tools, or other personal property brought into any Radiological Areas by the SUBCONTRACTOR, its employees, and any of its subcontractors and their employees.
- 5.6.2 The necessary survey to detect contamination will be performed immediately before removing any property from any location within the Jobsite Controlled Access Area or area specified by the CONTRACTOR. The SUBCONTRACTOR shall notify CONTRACTOR not less than three (3) working days before each property (including equipment and tools) removal.

- 5.6.3 CONTRACTOR'S intent is to work with the SUBCONTRACTOR to release all SUBCONTRACTOR'S equipment through the efforts of equipment placement (minimization of contact) and decontamination efforts on affected equipment pieces (i.e., buckets, tracks, beds). Because of the known inventory of constituents within the excavation areas, CONTRACTOR cannot guarantee the full release of SUBCONTRACTOR'S equipment or parts thereof.
- 5.6.4 Any equipment, except for treatment equipment designed and intended to come into direct contact with contaminated material, that cannot be decontaminated or free released (radiological) in a timely manner will not be released back to the SUBCONTRACTOR and becomes the property of the CONTRACTOR/OWNER. At the sole discretion of the CONTRACTOR, additional compensation to the SUBCONTRACTOR may be made for the contaminated equipment.
- 5.6.5 In any event, the SUBCONTRACTOR shall be responsible for all CONTRACTOR and SUBCONTRACTOR costs incurred when contamination of equipment/material results from violation of CONTRACTOR'S Radiological Control Program.
- 5.6.6 Prior to release of any equipment, SUBCONTRACTOR shall consult with CONTRACTOR to determine whether decontamination is necessary.

6.0 GENERAL SUBCONTRACT PROVISIONS

SC 6.1 WORK HOURS AND FACILITY CLOSURE DAYS

6.1.1 Site Work Hours

6.1.1.1 Site Work hours are from 6:00 a.m. to 4:30 p.m. Monday through Friday (5 days per week, 10/hours per day). SUBCONTRACTOR shall be onsite when the Construction Subcontractor is performing work requiring Construction Quality Assurance (CQA) oversight. Deviation from the approved Site work hours shall be requested in writing from the CONTRACTOR and such approval shall not be unreasonably withheld.

CONTRACTOR recognizes the following Facility Closure days:

New Year's Day	Labor Day
Presidents Day*	Thanksgiving Day
Memorial Day	Day before Thanksgiving
Independence Day	Christmas Day
Day before or after Christmas	

*Facility closure is not applicable to Building Trades Craft

6.1.1.2 SUBCONTRACTOR is responsible for contacting the Subcontract Technical Representative with support requirements on Facility Closure dates with a 72-hour advance written notice to the CONTRACTOR. The SUBCONTRACTOR shall not perform any work at the jobsite on any Facility Closure Day without CONTRACTOR approval in advance.

6.1.1.3 SUBCONTRACTOR shall take into consideration that the above work schedule may be deviated from based upon the official Department of Energy, Richland Operations Office (RL) process for declaring changes to the Hanford Site work schedule due to inclement weather conditions. SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the general and local conditions, including, but not limited to, climatic conditions and seasons.

6.1.2 Notification System

6.1.2.1 The WCH notification system at 372-9002 will be used for informing all WCH employees and Subcontractors when adverse weather conditions necessitate a site closure, delay in the start of work, or early release from work.

6.1.2.2 Most of the area radio stations are notified of work cancellation or delay before 5:00 a.m., however, to receive the timeliest information, employees and Subcontractors should tune into the following Emergency Alerting System stations:

Tri-Cities	KONA (610 AM or 105.3 FM)
Yakima Valley	KMWX (1460 AM)
	KFFM (107.3 FM)

6.1.2.3 Notifications will also be provided over the Hanford radio station (530 AM).

6.1.3 Variable Conditions May Affect Site Areas Differently

6.1.3.1 Due to the size of the Hanford Site, adverse weather conditions may affect separate parts of the site differently. In these cases, the work delay/early release may only apply to those employees and/or Subcontractors working in the most affected areas. In the event a project needs an individual to be present onsite during adverse weather, CONTRACTOR shall notify SUBCONTRACTOR.

6.1.3.2 When the start of work is delayed due to inclement weather conditions, the adjusted start time is intended to give employees and/or Subcontractors adequate time to arrive at work safely. Arriving ahead of the adjusted start time could jeopardize the completion of maintenance work, and could put the employee at risk in terms of unsafe road conditions and/or unsafe walking surfaces at the work place. If a decision is made for an early release of employees and/or Subcontractors from work due to severe weather conditions, the CONTRACTOR will notify the SUBCONTRACTOR.

SC 6.2 WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL

6.2.1 Working Hours:

The SUBCONTRACTOR shall not perform Work at the Jobsite on other than the Site Work hours specified in subparagraph 6.1.1 above, unless it has given prior written notification to CONTRACTOR and has received approval in advance, as provided in this Special Condition.

6.2.2 Notification:

The SUBCONTRACTOR shall give CONTRACTOR at least four (4) hours prior notice if its employees are to be working after the site work hours specified in SC 6.1.1. The SUBCONTRACTOR shall give CONTRACTOR notice on the prior working day if its employees will be working before the site work hours specified in SC 6.1.1, or will be working at any time on Saturday, Sunday, or holidays. The notice shall include the type of Work to be performed, location of Work, date and hours of Work, and description of any heavy equipment to be used. CONTRACTOR advance approval is required any time Work is to be performed at other than normal shift periods.

SC 6.3 SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION

The Subcontract Performance Period shall commence on the date of Award of the Subcontract and extend through and including September 30, 2011.

SC 6.4 INCREMENTAL FUNDING OF SUBCONTRACT

The CONTRACTOR'S obligation to pay the Subcontract price in accordance with Section entitled, "Measurement for Payment and Payment for Work", of the Subcontract Special Conditions is subject to the provisions and limitations further set forth by the following. The CONTRACTOR'S obligation under this Subcontract is hereby limited notwithstanding any provision of the "Measurement for Payment and Payment for Work" section or any other section or provision of this Subcontract.

- 6.4.1 Allotment of Funds: Of the total Subcontract price, only specific portions of the total amount are estimated to be available, allotted by FY, for this Subcontract. The CONTRACTOR shall not be obligated under this Subcontract to the SUBCONTRACTOR on any theory or basis for total payment in excess of total allotments up to that time. Furthermore, the SUBCONTRACTOR is not to expend any effort on Work for which the CONTRACTOR has not provided the SUBCONTRACTOR written authorization to proceed.

CONTRACTOR shall notify SUBCONTRACTOR of the estimated amount of funding to be available for each subsequent FY. It is contemplated, but not warranted, that the full amount of estimated funds for each FY's allotment will be available by October 1st, of each FY. CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the exact amount of each FY allotment of funds as soon as such becomes known.

6.4.2 Schedule:

6.4.2.1 The SUBCONTRACTOR agrees to schedule and perform or have performed the contract work in such a manner as to ensure that, in the event of termination of this contract pursuant to Subcontract General Conditions, Clause, "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) would not exceed the total amount allotted at the time to the Subcontract. The CONTRACTOR shall not be obligated in any event to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this subcontract, anything to the contrary or any other provision of this Subcontract notwithstanding.

6.4.2.2 To insure compliance with the requirements of subparagraph 6.4.2.1 above, all schedules required elsewhere in this Subcontract shall relate to and describe the SUBCONTRACTOR'S proposed plan for performance of work and representation of work actually performed to the amount then allotted to this Subcontract. Furthermore, SUBCONTRACTOR shall schedule and relate planning for future performance of Work to the table of estimated allotments to this Subcontract set forth in subparagraph 26.1, above.

- 6.4.3 Notices – Actions When Costs Approach Total Amounts Allotted: Until such time as the CONTRACTOR has allotted funds up to the full Subcontract price, including any adjustments thereto, the SUBCONTRACTOR shall notify the CONTRACTOR in writing 30 days in advance of the point when, in the event of termination of this Subcontract pursuant to the article hereof entitled "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) will approximate eighty-five percent (85%) of the total amount then allotted to the Subcontract. Upon receipt of such notice, the CONTRACTOR may take one of, or a combination of, the following actions:

6.4.3.1 Instruct the SUBCONTRACTOR to continue performance of the Subcontract to the extent permitted by the amount of funds then allocated to this Subcontract;

6.4.3.2 Increase the amount of funds allotted to the Subcontract and instruct the SUBCONTRACTOR to proceed with work not previously funded;

6.4.3.3 Order the SUBCONTRACTOR to suspend all or any part of the work in accordance with Subcontract General Conditions, "Suspension". If the suspension of work has resulted from the failure of the SUBCONTRACTOR to schedule and perform the Subcontract work in accordance with the provisions of subparagraph 6.4.2 above, the SUBCONTRACTOR shall not be entitled to an equitable adjustment in Subcontract price nor time, nor shall the costs of the suspension be allowable in any subsequent termination of the Subcontract for the convenience of the CONTRACTOR, irrespective of the provisions of the "Suspension" article, the "Termination for Convenience" article, or any other section or provision of the Subcontract; or

6.4.3.4 Terminate the performance of all or part of the work under this Subcontract in accordance with the "Termination for Convenience" section; or

6.4.3.5 Direct the SUBCONTRACTOR to take such action, as is agreed by the parties in writing to be appropriate under the circumstances (provided such action does not exceed the total funds then allotted).

6.4.4 SUBCONTRACTOR Excused From Further Performance: Before the allotment of funds up to the total Subcontract price (including any adjustments thereto), when the SUBCONTRACTOR'S performance has reached the point at which in the event of exercise of the "Termination" section of this Subcontract, the total amount payable by the CONTRACTOR would equal 100% (one hundred percent) of the amount then allotted to this Subcontract, the SUBCONTRACTOR shall immediately notify the CONTRACTOR and shall make no further commitments or expenditures (except to meet existing commitments and liabilities). The CONTRACTOR shall not be obligated to pay the SUBCONTRACTOR an amount in excess of the total amount then allotted to the Subcontract. If additional funds are not allotted by the date set forth in subparagraph 6.4.1 above, or such later date as may be agreed to by both parties, the SUBCONTRACTOR shall not be obligated to continue performance under this Subcontract and the CONTRACTOR will, upon written request of the SUBCONTRACTOR, terminate the Subcontract pursuant to the provisions of the "Termination for Convenience" article, provided, however that in no event shall the CONTRACTOR be obligated to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this Subcontract.

6.4.5 If the SUBCONTRACTOR incurs additional costs or is delayed in the performance of the work under this Subcontract solely by reason of the failure of the CONTRACTOR to allot additional funds in accordance with the subparagraph 6.4.1 above, and if additional funds are allotted, equitable adjustments shall be made in Subcontract price and performance time.

6.4.6 The CONTRACTOR may at any time prior to termination, and with the consent of the SUBCONTRACTOR after notice of termination, allot additional funds to this Subcontract.

6.4.7 Nothing in this clause shall affect the right of the CONTRACTOR to terminate this Subcontract pursuant to the article of this Subcontract entitled, "Termination for the Convenience of the Government".

6.4.8 Change Orders: Changes issued pursuant to Subcontract General Conditions, "Changes", shall not be considered authorization for the SUBCONTRACTOR to exceed the amount allotted to this Subcontract in the absence of a statement in the Change Order, or other written notice to the SUBCONTRACTOR, increasing the amount allotted to this Subcontract.

SC 6.5 TECHNICAL DIRECTION

6.5.1 The term "technical direction" is defined as: (1) directions to the SUBCONTRACTOR, which shift work emphasis between work areas, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to facilitate the Subcontract Scope of Work; (2) provision of written

information to the Subcontract that assists in the interpretation of drawings, specifications or technical portions of the work description; and (3) review and approval of technical reports, drawings, specifications, and technical information to be delivered by the SUBCONTRACTOR to the CONTRACTOR under the subcontract.

- 6.5.2 Technical direction must be within the Scope of Work stated in the subcontract. Unless so delegated, CONTRACTOR'S Subcontract Technical Representative (STR) does not have the authority to, and may not issue any direction which: (1) constitutes an assignment outside the Scope of Work; (2) constitutes a change as defined in the Subcontract Clause, "Changes"; (3) in any manner causes an increase or decrease in the total estimated subcontract cost, the fixed unit rates, if any, or the time required for subcontract performance; and (4) changes any of the expressed terms and conditions.
- 6.5.3 The SUBCONTRACTOR shall proceed promptly with the performance of technical direction issued by the CONTRACTOR'S STR in the manner prescribed by this article and within the authority under the provisions of this article. If, in the opinion of the SUBCONTRACTOR, any instruction or direction by the CONTRACTOR'S STR falls within one of the categories defined in subparagraph 6.4.2 above, the SUBCONTRACTOR shall not proceed, but shall notify the Subcontract Administrator in writing within ten (10) working days after receipt of any such instruction or direction and shall request the Subcontract Administrator to modify the Subcontract accordingly.
- 6.5.4 A failure of the SUBCONTRACTOR and Subcontract Administrator to agree that the technical direction is within the Statement of Work or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the clause entitled, "Disputes".

SC 6.6 TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY)

Business related travel for non-represented employees is not generally authorized. In the event travel is authorized, SUBCONTRACTOR shall comply with WCH procedures. All authorized travel will be reimbursed in accordance with the Federal Travel Regulations (FTRs). Additionally, the following clauses apply:

6.6.1 En Route Expenses:

- 6.6.1.1 Transportation via public carrier will be reimbursed up to the equivalent of least cost economy (refundable) air fare plus actual and reasonable expenses in traveling shortest and most direct route from traveler's home office, to Richland Washington or at other such locations and return, at request of CONTRACTOR. Meals and incidental expenses (M&IE) includes meals, laundry, tips and phone calls to reserve lodging accommodations. Reimbursement for local travel is not authorized.
- 6.6.1.2 Subcontractor shall be reimbursed for lodging, subsistence and miscellaneous expenses incurred by SUBCONTRACTOR when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR consistent with the limits as described in the Federal Travel Regulations (FTR) set forth in 41 Code of Federal Regulations (CFR), latest supplement. This bulletin specifies expense limits for all geographical areas of the United States.

6.6.2 Automobile Rental:

Car rental expenses incurred by the subcontractor when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR for actual and reasonable cost incurred, supported by receipts.

6.6.3 Personal Automobile:

Mileage costs via the most direct route will be reimbursed at the current Government travel regulation rate. No reimbursement will be provided for a second automobile. Total costs for this mode of transportation may not exceed the total allowances that would have been provided had the employee traveled by public air carrier (including expenses to/from the airport and the lodging and M&IE per diem. Reimbursement for receipted toll charges is allowed over and above the mileage and M&IE.

6.6.4 Lodging, Meals, and Incidental Expenses:

6.6.4.1 Reimbursement for Temporary Assignment lodging, meals, and incidental expenses will be in accordance with the Lodging Plus methodology for the first thirty (30) days of assignment or until long-term lodging is obtained, whichever occurs first. After long-term lodging is obtained, or the thirty (30) day period has elapsed, the per diem allowance for lodging and meals and incidental expenses will be no more than seventy-five percent (75%) of the approved rate otherwise applicable.

6.6.4.2 Rental of a standard single apartment in the area, after long term lodging is obtained, or the 30-day period has elapsed, rent will be expensed via a Travel Expense Report. Proof of lodging, via receipts/copy of a signed lease agreement is required.

6.6.4.3 Subcontractors on single status assignments of three months or more may be granted trips home with approval, not to exceed a frequency of once every six weeks provided that a minimum of 30 days remain in the assignment. All travel shall be approved by the WCH STR based upon current work load.

Trips normally will be scheduled for weekends and will be on Subcontractor's time. Transportation and subsistence for trips home will be reimbursed subject to FTRs. If a Subcontractor elects to drive home, the amount may not exceed what the Subcontractor would have incurred for economy class round-trip airfare transportation home. Per Diem for M&IE is not paid during the "at-home" portion of a home leave. Lodging costs are not reimbursed for either the "en route" or the "at home" portion of home leave, however, lodging costs at the work location during home leave will be reimbursed if monthly rates are applicable.

6.6.5 Interruption of Per Diem:

During the per diem period, the meals/incidentals portion is forfeited in the following circumstances:

6.6.5.1 When Personal Time Off is taken in excess of two consecutive work days for reasons other than illness;

6.6.5.2 When Personal Time Off is taken for more than two consecutive days in conjunction with a weekend (e.g., Thursday, Friday, Weekend, Monday).

6.6.5.3 Any vacation period(s) taken in conjunction with travel including weekends or holidays taken in conjunction with vacation, and the periods covering return trips to the place of abode, are not reimbursable.

6.6.6 Other Provisions:

6.6.6.1 Receipts shall be provided substantiating travel expenses, lodging, rental cars, etc. Receipts are not required for meals and incidental expenses. Reimbursement for M&IE will not be made in excess of the maximum allowable daily totals.

6.6.6.2 This allowance shall be reduced on the first and last day of travel in accordance with the FTRs as follows:

Travel Duration	M&IE Reimbursement
Day of Departure	75% of Applicable M&IE Rate
Full day(s) of Travel	100% of Applicable M&IE Rate
Last Day of Travel	75% of Applicable M&IE Rate

6.6.6.3 Subcontractors on business travel in support of this Subcontract shall only be paid Labor Hours for travel during regular work hours. Any travel time paid in excess of 8 hours shall be paid at the regular straight time rate.

SC 6.7 INTEGRATED WORK CONTROL PROGRAM

Integrated Work Control (IWC) utilizes multi-disciplinary teamwork and worker involvement to support the identification, analysis, and mitigation of work site hazards; development of work packages; performance of work; and use of the observational approach for newly identified hazards. [10 CFR 851.21, 21, and 22]. The work packages for construction of Cells 9 & 10 will be prepared by the Construction Subcontractor and will be developed and approved for release utilizing a graded approach based on risk and complexity of the work hazards and worker competence. [10 CFR 851.22].

The SUBCONTRACTOR's work performed within the Construction Subcontractor's work area shall be performed in accordance with the Construction Subcontractor's Integrated Work Control Program. The Integrated Work Control Program requirements are specified in Exhibit K.

SC 6.8 SAFETY INCENTIVE

6.8.1 Incentive

In addition to the need to protect the health and safety of the subcontractor's worker, the ability to maintain a safe and incident free work site ensures numerous financial benefits including a more productive work force, better relationships with the workers, lower insurance costs for subcontractors working, and few reports of incidents. The precise value of the items resulting from an accident at the site cannot be readily quantified. Therefore, the CONTRACTOR has allocated a quarterly financial incentive that allows the SUBCONTRACTOR the opportunity to earn an amount equal to Four Hundred Dollars (\$400.00) per eligible employee (computed in accordance with paragraph 6.8.3). Payment of incentive to SUBCONTRACTOR or sub-tier subcontractor employee is based on achieving zero OSHA Recordable Cases and OSHA Lost Work Day Cases (Days Away from Work, or restricted Work Days, or both), for WCH Hanford Site Work performed by SUBCONTRACTOR and SUBCONTRACTOR's sub-tier subcontractors as defined in paragraph 6.8.2 below.

6.8.2 Eligible Employees

6.8.2.1 Eligible SUBCONTRACTOR Employees are defined as any category of employee who works a minimum of three hundred (300) hours in any quarter for the SUBCONTRACTOR on a WCH project at the Hanford Site.

6.8.2.2 Eligible Sub-tier Subcontractor Employees are defined as any category of sub-tier subcontractor employee performing a minimum of three hundred (300) hours of long term field work during any calendar quarter when work is performed on a WCH Hanford Site project. Long term field work is defined a sub-tier subcontract work with a period of continuous performance in excess of six (6) months during the subcontract period of performance. The SUBCONTRACTOR will flow down the safety incentive to eligible sub-tier subcontractor employees meeting the criteria above.

6.8.3 Safety Incentive Periods and Computation

- 6.8.3.1 Initial Incentive Period – The Incentive Period will begin on the first day of the next month following the issue of approval by the CONTRACTOR for the SUBCONTRACTOR to mobilize at the Hanford Site. The first incentive payment will be pro-rated to the end of the current calendar year quarter.
- 6.8.3.2 Subsequent Incentive Periods – Subsequent Incentive Periods will be on a calendar quarter basis (January – March, April – June, July – September, or October – December) and continue through the end of the subcontract term. For a subcontract ending in mid-quarter, the incentive will be pro-rated based on the number of weeks completed in that quarter.

The recordable and Lost Work Day criteria and corresponding percentage of Safety Incentive earned are specified in the following table:

**Safety Performance Incentive Fee Schedule
Quarterly Safety Goals**

Safety Incident	One OSHA TRC recordable injury or illness (Medical Treatment or DART-Restricted Case)	Two OSHA TRC recordable injury or illnesses (Medical Treatment or DART-Restricted Case)	One OSHA recordable Lost Workday Case (Day Away DART-Day Away Case)	One or more OSHA TRC or DART Case(s) in each of two consecutive quarters
Reductions to Incentive Earned	Fifty percent (50%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive

Note: Failure to report an injury or accident, or the intentional and unauthorized altering of the scene of an injury or accident will result in a one hundred percent (100%) reduction of the quarterly incentive fee for two consecutive quarters.

- 6.8.3.3 Safety Incentive Payment – The Safety Incentive will be paid quarterly on the basis of four hundred dollars (\$400) per eligible employee per quarter to include sub-tier subcontractors as outlined above. The SUBCONTRACTOR will supply to the CONTRACTOR a listing of employees eligible to receive the incentive on a quarterly basis, which will establish the total potential amount of the incentive, subject to reductions as listed above. Subsequent to the distribution of incentive to employees in each quarter, SUBCONTRACTOR will provide to CONTRACTOR confirmation that the listed eligible employees received incentive payouts. An eligible employee is defined as a SUBCONTRACTOR employee that has worked for the SUBCONTRACTOR on a WCH project for a minimum of three hundred (300) hours in the quarter (See 6.8.2).
- 6.8.3.4 At SUBCONTRACTOR's discretion, a portion of the Safety Incentive may be retained for safety-related lunches, prizes, gifts, etc. for the benefit of the work force; however, it is expected that at least ninety percent (90%) will be passed along to SUBCONTRACTOR employees in the form of an equally distributed cash payout.
- 6.8.3.5 Where the SUBCONTRACTOR has an eligible sub-tier subcontractor, the total sub-tier subcontractor incentive amount will be based on four hundred dollars (\$400) per employee per quarter (see 6.8.2.2), minus any deductions outlined in the Safety Performance Incentive Fee Schedule. The SUBCONTRACTOR will inform the sub-

tier subcontractor of the expectation to pass along at least ninety percent (90%) of the incentive to its employees in the form of equally distributed cash payouts.

ATTACHMENT 1
EXHIBIT "B"
SPECIAL CONDITIONS
CONSTRUCTION SUBCONTRACTS

FOR USE WHEN AWARDING A SUBCONTRACT UNDER ARRA

Table of Contents

PREAMBLE	1
DEFINITIONS	1
A. FLOW DOWN PROVISION	1
B. SEGREGATION AND PAYMENT OF COSTS.....	2
C. PROHIBITION ON USE OF FUNDS.....	2
D. WAGE RATES	2
E. PUBLICATION	2
F. REGISTRATION REQUIREMENTS	2
G. UTILIZATION OF SMALL BUSINESS	2
H. CERTIFICATIONS	3
I. MONTHLY OR QUARTERLY REPORTING REQUIREMENTS	3
J. ADDITIONAL FAR CLAUSES APPLICABLE TO RECOVERY ACT WORK	3
K. ACCOUNTING SYSTEM REQUIREMENTS FOR COST-TYPE SUBCONTRACTS	3
L. COST ACCOUNTING STANDARDS	4
M. WEEKLY REPORT	4
N. ADDITIONAL REPRESENTATIONS AND CERTIFICATIONS.....	4

PREAMBLE

Work performed under this subcontract will be funded, in whole or in part, with funds appropriated by the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, (Recovery Act or Act). The Recovery Act's purposes are to stimulate the economy and to create and retain jobs. The Act gives preference to activities that can be started and completed, expeditiously, including a goal of using at least fifty percent (50%) of the funds made available by it for activities that can be initiated not later than June 17, 2009.

Subcontractors should begin planning activities for their first tier suppliers, including obtaining a DUNS number (or updating the existing DUNS record), and registering with the Central Contractor Registration (CCR).

Be advised that Recovery Act funds can be used in conjunction with other funding as necessary to complete projects, but tracking and reporting must be separate to meet the reporting requirements of the Recovery Act and related Guidance. For projects funded by sources other than the Recovery Act, Contractors should plan to keep separate records for Recovery Act funds and to ensure those records comply with the requirements of the Act.

The Government has not fully developed the implementing instructions of the Recovery Act, particularly concerning the how and where for the new reporting requirements. The Subcontractor will be provided these details as they become available. The Subcontractor must comply with all requirements of the Act. If the Subcontractor believes there is any inconsistency between ARRA requirements and current Subcontract requirements, the issues will be referred to the Subcontract Specialist for reconciliation.

Be advised that special provisions may apply to projects funded by the Act relating to:

- Reporting, tracking and segregation of incurred costs;
- Reporting on job creation and preservation;
- Publication of information on the Internet;
- Protecting whistleblowers; and
- Requiring prompt referral of evidence of a false claim to the Inspector General.

DEFINITIONS

For purposes of this clause, "Covered Funds" means funds expended or obligated from appropriations under the Recovery Act. Covered funds will have special accounting codes and will be identified as Recovery Act funds in the Subcontract and/or modification using Recovery Act funds. Covered Funds must be reimbursed by September 30, 2015.

"Non-Federal Employer" means any employer with respect to Covered Funds – the Contractor or Subcontractor, as the case may be, if the Contractor or Subcontractor is an employer; and any professional membership organization, certification of other professional body, any agent or licensee of the Federal Government, or any person acting directly or indirectly in the interest of an employer receiving Covered Funds; or with respect to Covered Funds received by a State or local government, the State or Local Government receiving the funds and any Contractor or Subcontractor receiving the funds and any Contractor or Subcontractor of the State or local government; and does not mean any department, agency, or other entity of the Federal Government.

A. FLOW DOWN PROVISION

This clause must be included in every first-tier subcontract.

B. SEGREGATION AND PAYMENT OF COSTS

Subcontractor must segregate the obligations and expenditures related to funding under the Recovery Act. Financial and accounting systems should be revised as necessary to segregate, track and maintain these funds apart and separate from other revenue streams. No part of the funds from the Recovery Act shall be commingled with any other funds or used for a purpose other than that of making payments for costs allowable for Recovery Act projects. Where Recovery Act funds are authorized to be used in conjunction with other funding to complete projects, tracking and reporting must be separate from the original funding source to meet the reporting requirements of the Recovery Act and OMB Guidance.

Invoices must clearly indicate the portion of the requested payment that is for work funded by the Recovery Act.

C. PROHIBITION ON USE OF FUNDS

None of the funds provided under this Subcontract derived from the Recovery Act -may be for any casino or other gambling establishment, aquarium, zoo, golf course, or swimming pool.

D. WAGE RATES

All laborers and mechanics employed by Subcontractors and lower-tier suppliers on projects funded directly by or assisted in whole or in part by and through the Federal Government pursuant to the Recovery Act shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with subchapter IV of chapter 31 of title 40, United States Code. With respect to the labor standards specified in this section, the Secretary of Labor shall have the authority and functions set forth in Reorganization Plan number 14 of 1950 (64 Stat. <http://www.dol.gov/esa/whd/contracts/dbra.htm>).

E. PUBLICATION

Information about this agreement will be published on the Internet and linked to the website: www.recovery.gov, maintained by the Accountability and Transparency Board (the Board). The Board may exclude posting contractual or other information on the website on a case by case basis when necessary to protect national security or to protect information that is not subject to disclose under sections 552 and 552a of title 5, United States Code.

F. REGISTRATION REQUIREMENTS

Subcontractor shall ensure that all first-tier subcontractors/suppliers have a DUNS number and are registered in the Central Contractor Registration (CCR) no later than the date the first report is due.

G. UTILIZATION OF SMALL BUSINESS

Subcontractor shall to the maximum extent practicable give a preference to small business in the award of subcontracts for projects funded by Recovery Act dollars.

H. CERTIFICATIONS

Subcontractor shall certify in each monthly submittal of its cost summary file that the costs included in the summary file for Recovery Act work were incurred only to accomplish the Recovery Act work.

With the submittal of each invoice, Subcontractor shall certify that the items delivered and/or work was performed for a purpose authorized under the Recovery Act.

I. MONTHLY OR QUARTERLY REPORTING REQUIREMENTS

Monthly and/or quarterly reports will be further defined but may include and not be limited to: major hiring actions that create newly "created" or "retained" jobs by the Subcontractor; key starts and completions; enforceable regulatory dates; approval of key regulatory decisions; project critical decisions; delivery of critical Government Furnished Services and Items.

J. ADDITIONAL FAR CLAUSES APPLICABLE TO RECOVERY ACT WORK

FAR Reference	Title	Fill-In Information See FAR 52.104(d)
FAR 52.203-15	Whistleblower Protections Under the American Recovery and Reinvestment Act of 2009 (Mar 2009)	None
FAR 52.204-11	American Recovery and Reinvestment Act – Reporting Requirements (Mar 2009)	None
FAR 52.215-2	Audit and Records – Negotiation (Jun 1999), Alt. I (Mar 2009)	None
FAR 52.216-24	Limitation of Government Liability	(a) \$28,000,000. (b) \$28,000,000.
FAR 52.225-23	Required Use of American Iron, Steel, and Other Manufactured Goods—Buy American Act – Construction Materials under Trade Agreements (Mar 2009)	"None"
FAR 52.225-24	Notice of Required Use of American Iron, Steel, and Other Manufactured Goods – Buy American Act – Construction Materials under Trade Agreements (Mar 2009)	"None"

K. ACCOUNTING SYSTEM REQUIREMENTS FOR COST-TYPE SUBCONTRACTS

Subcontractor shall submit an explanation of how costs related to the Recovery Act work will be accumulated, recorded, invoiced, and reported using the Subcontractors account system in order to assure that costs associated with Recovery Act work are separate from other costs incurred under the Subcontract. The Subcontractor shall describe how its existing accounting system, any proposed changes, and/or new oversight controls will help assure this necessary separation of Recovery Act funds. The Subcontractor shall identify the cognizant Government audit agency that has issued reports regarding the adequacy of the accounting system for accumulating and billing costs under Government contracts. This data must also be provided for each sub-tier contractor that is performing work under a cost-type Subcontract.

L. COST ACCOUNTING STANDARDS

If the Subcontractor or lower-tier subcontractors(s) performing work are covered by Cost Accounting Standards (CAS), the Subcontractor shall discuss the adequacy of the disclosure statement. The Subcontractor shall also identify whether the cognizant Government audit agency has issued any audit reports on the compliance with the CAS requirements of any of these entities.

M. WEEKLY REPORT

Subcontractor shall submit a weekly personnel report to WCH that sets forth individual names, job titles, full or part time status and hours worked. These reports shall be submitted electronically to the WCH Subcontract Specialist no later than Tuesday for the preceding week. The form is available at: <http://www.washingtonclosure.com/procure/forms.html>.

N. ADDITIONAL REPRESENTATIONS AND CERTIFICATIONS

Subcontractor certifies that it has a DUNS Number: _____

Subcontractor certifies that it is registered with the Central Contractor Registration (CCR).

Subcontractor did or did not receive greater than 80% of its annual gross revenue from Federal contracts (and subcontracts), loans, grants (and sub-grants) and cooperative agreements.

Subcontractor did or did not receive greater than \$25,000,000 in annual gross revenues from Federal Contracts (and subcontracts), loans, grants (and sub-grants) and cooperative agreements.

The public does or does not have access to information about the compensation of the senior executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986.

Subcontractor understands and will comply with reporting requirements for compensation in accordance with FAR 52.204-11 – American Recovery and Reinvestment Act – Reporting Requirements.

Firm: _____

Name: _____
(Type or Print)

Signature: _____

Date: _____

SENSITIVE

EXHIBIT "C"

Schedule of Quantities and Prices

**WASHINGTON CLOSURE HANFORD, LLC
River Corridor Closure Project**

ERDF CELLS 9 & 10 CONSTRUCTION QUALITY ASSURANCE

Subcontract Number: S013213A00

EXHIBIT "C"
ERDF CELLS 9& 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A. - SCHEDULE OF QUANTITIES AND PRICES

1.0 WORK TO BE PERFORMED - SUBCONTRACTOR shall furnish trained and qualified labor, materials, equipment, tools, supplies, transportation, facilities, technical and professional services, management, supervision, and other necessary articles; and performance of operations and incidental activities necessary to complete the construction quality assurance (CQA) activities for the construction of ERDF Super Cells 9 & 10 in accordance with the Subcontract Documents.

2.0 LUMP SUM AND UNIT PRICES - The lump sum and unit prices herein for performing Work are firm and fixed for the duration of the Subcontract and are not subject to escalation for any cause, including, but not limited to, wage escalation, fuel escalation, etc. Payment of lump sum and unit prices shall constitute full compensation for performance of the corresponding work and shall cover direct costs; indirect costs; overhead costs; profit; and general and administrative expenses of whatever nature, incurred by the SUBCONTRACTOR in accomplishing the work in accordance with the provisions of the Subcontract Documents.

Progress payments will be paid in accordance with Exhibit "B" SC 3.3 *Measurement for Payment and Payment for Work*. Work completed for Lump Sum Pay Items each month will be measured for payment as a percentage of the total work completed for the Pay Item. CONTRACTOR and SUBCONTRACTOR will negotiate the value of the SUBCONTRACTOR performance for each monthly progress payment. Thus paid, the lump sum amount will constitute full compensation for work covered under the Pay Item.

The following activities shall be considered incidental to the pay items described below and shall not be paid separately. The Subcontractor must proportionally allocate these activities to each pay item:

- Incidental job burdens
- Attendance at meetings specified in Subcontract documents
- General home office expenses commonly known as G&A
- Management, supervision, and maintenance including, but not limited to, project superintendents, Quality Assurance/Site Safety Officers, office personnel, timekeeping and maintenance mechanics, etc.
- Housekeeping
- Other work necessary to successfully complete the Scope of Work under this Contract, including support to the Construction Subcontractor for preparation of Work Packages in accordance with the IWCP process.
- IWCP implementation.
- Progress As-Built Drawings and Specifications

3.0 ESTIMATED QUANTITIES FOR UNIT RATES - The SUBCONTRACTOR understands and agrees that any or all of this work may or may not be authorized, and that neither the CONTRACTOR nor the OWNER warrants that any or all of the work will be authorized. The SUBCONTRACTOR further understands and agrees to perform any portion of each item of authorized work at the stated unit price, which shall constitute full payment for authorized work.

EXHIBIT "C"
ERDF CELLS 9& 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A. - SCHEDULE OF QUANTITIES AND PRICES

CONTRACTOR approval is required prior to exceeding any estimated quantity otherwise the SUBCONTRACTOR risks not being reimbursed for the overage.

4.0 FUNDING LIMITATIONS - Total payments under this Subcontract shall not exceed the estimated value of this Subcontract without a written Amendment to the Subcontract.

EXHIBIT "C"
ERDF CELLS 9& 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A-1. SCHEDULE OF QUANTITIES AND PRICES

Pay Item	Reference	Description	Unit	Estimated Quantity	Unit Price	Extension
1	Exhibit D, 2.1.1	Mobilization/Demobilization Activities	Lump Sum	1	(b)(4)	
2	CQAP, Table 4-1.1	Earthwork Monitoring & Testing	Lump Sum	1		
3	Exhibit D, 2.1.3 CQAP, Table 4-1.12	Test Fill Monitoring & Testing	Lump Sum	1		
4	CQAP, Table 4-1.2	Admix Soil Liner Monitoring & Testing	Lump Sum	1		
5	CQAP, Table 4-1.3	Gravel Drainage Layers Monitoring & Testing	Lump Sum	1		
6	CQAP, Table 4-1.4	Operations Layer Monitoring & Testing	Lump Sum	1		
7	CQAP, Table 4-1.5	Anchor Trench/Side Slope Riser Pipe Trench Monitoring & Testing	Lump Sum	1		
8	CQAP, Table 4-2.1 <i>See Note (1)</i>	HDPE Geomembrane Monitoring	Lump Sum	1		
9	CQAP, Table 4-2.2 <i>See Note (2)</i>	Geotextile Monitoring	Lump Sum	1		
10	CQAP, Table 4-2.3 <i>See Note (3)</i>	Geocomposite Monitoring	Lump Sum	1		
11	CQAP, Table 4-2.4 <i>See Note (4)</i>	Geonet Monitoring	Lump Sum	1		
12	Exhibit D, 2.1.2 CQAP, 4.7	Leachate Collection System Monitoring & Testing	Lump Sum	1		
13	Exhibit D, 2.1.2 CQAP, 4.7	Leachate Transmission System Monitoring & Testing	Lump Sum	1		
14	Exhibit D, 2.1.2 CQAP, 4.7	Leachate Storage Tank #3 Monitoring & Testing	Lump Sum	1		
15	Exhibit D, 2.1.2 CQAP, 4.7	Leachate Storage Tanks #1 & #2 Liner Monitoring & Testing	Lump Sum	1		
16	Exhibit D, 2.1.4	Acceptance Testing	Lump Sum	1		
17	Exhibit D, 2.1.5	Documentation	Lump Sum	1		
18	Exhibit D, 2.1.6	CQA Subcontractor Submittals	Lump Sum	1		
19	Exhibit D, 2.1.7	Receiving Inspections	Lump Sum	1		
20	Exhibit D, 2.1.8	Review Construction Subcontractor's Submittals	Lump Sum	1		
21	Exhibit D, 2.1.9.2	CQA Surveying	Hours	500		
22	CQAP, Tables 4-2.1, 4-2.2, 4-2.3, 4-2.4. <i>See Note (5)</i>	Geosynthetics Conformance Tests	Lump Sum	1		
23	Exhibit B, SC 6.8	Safety Incentive	Quarter	7	See Exhibit B, SC 6.8	(b)(4)

EXHIBIT "C"
ERDF CELLS 9 & 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A-1. SCHEDULE OF QUANTITIES AND PRICES

24	Change Notice 08	Change Notice 08 adds funds to Sub-Contract S013213A00 for impacts to Envirotech due to the acceleration of the construction schedule.	Lump Sum	1	(b)(4)
25	Change Notice 09	Addition of the Washington State Department of Health Licensing Requirements for Nuclear Density Gauges.	Lump Sum	1	
26	Change Notice 11	Pay Overtime as Directed by WCH	Hourly	Varies as Directed	
Subtotal for Pay Items 1 - 23 (including applicable taxes)					(b)(4)

EXHIBIT "C"
ERDF CELLS 9& 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A-1. SCHEDULE OF QUANTITIES AND PRICES

Supplemental Testing and Engineering Work:

S.1	ASTM D 422	Particle Size Analysis	Test	10	(b)(4)
S.2	ASTM D 4318	Atterberg Limits	Test	10	
S.3	ASTM D 1557	Modified Proctor	Test	10	
S.4	ASTM D 698	Standard Proctor	Test	10	
S.5	ASTM D 6938	In-Place Density and Water Content	Test	50	
S.6	ASTM D 1556	Sand Cone	Test	10	
S.7	ASTM D 5084	Hydraulic Conductivity	Test	5	
S.8	ASTM D 6391	Two-Stage Borehole Test	Test	1	
S.9	ASTM D 5321	Coefficient of Friction by Direct Shear	Test	2	
S.10		Registered Professional Engineer	Hours	100	
S.11		CQA Technician	Hours	100	
S.12		CQA Engineer	Hours	100	
S.13		CQA Surveying	Hours	200	
Subtotal for Supplemental Work Items S.1 – S.13 (including applicable taxes)					(b)(4)
TOTAL FOR PAY ITEMS 1 – 23 and S. – S.13 (including applicable taxes)					(b)(4)

Notes:

- (1) Pre-Construction geomembrane conformance testing shall be included under Pay Item No. 22.
- (2) Pre-Construction geotextile conformance testing shall be included under Pay Item No. 22.
- (3) Pre-Construction geocomposite conformance testing shall be included under Pay Item No. 22.
- (4) Pre-Construction geonet conformance testing shall be included under Pay Item No. 22.
- (5) Geosynthetic conformance tests shall include the Pre-Construction tests specified for:
 - Geomembrane in CQAP, Table 4-2.1
 - Geotextile in CQAP, Table 4-2.2
 - Geocomposite in CQAP, Table 4-2.3
 - Geonet in CQAP, Table 4-2.4

EXHIBIT "C"
ERDF CELLS 9& 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A-2. MEASUREMENT FOR PAYMENT, AND PAYMENT

Measurement and Payment

Pay Items 1 – 20 and 22:

Measurement for payment will be by the Lump Sum unit rates established in the Subcontract. Payment includes full compensation to complete the referenced work activity.

Pay Item 21 CQA Surveying:

Measurement for payment will be by the Hour unit rate based on the hours the survey crew is onsite performing the as-built survey work specified in Exhibit "D", 2.1.9.2.

Payment includes full compensation for field and office work to perform as-built surveys and to prepare the as-built drawings specified in Exhibit "D", 2.1.9.2. As-built drawings shall be prepared in accordance with Exhibit "B", SC 4.3.2.5 and SC 4.3.2.7.

CONTRACTOR approval is required prior to exceeding any estimated quantity, otherwise the SUBCONTRACTOR risks not being reimbursed for the overage.

Pay Item 23 Safety Incentive:

Measurement and payment for the Safety Incentive will be made in accordance with Exhibit "B" SC 6.8 Safety Incentive.

Pay Items 24-26 Change Notices:

Change Notice pay items should be invoiced to WCH on a lump sum basis. The specific change notice should be referenced on the invoice when submitted. A change notice is eligible to be invoiced after it is modified into the contract. If a reoccurring change notice such as Overtime needs funds then funds will be added for that line item at the time of the next modification. **All Overtime must have prior approval from the STR.**

Supplemental Testing and Engineering Work Pay Items S.1 – S.13:

Supplemental Testing and Engineering Work Pay shall be measured and paid based upon hours worked as authorized by the CONTRACTOR's Subcontract Technical Representative (STR) **prior to being worked**. Prices are fully burdened and inclusive of all costs including, but not limited to, labor, G&A, overhead and profit.

The CONTRACTOR makes no guarantee that the number of tests and hours listed will be required. The rates provided will be used for pricing of adjustments if any changes are required in the Subcontract Scope of Work.

EXHIBIT "C"
Schedule of Quantities and Prices

WASHINGTON CLOSURE HANFORD, LLC
River Corridor Closure Project

ERDF CELLS 9 & 10 CONSTRUCTION QUALITY ASSURANCE

Subcontract Number: S013213A00

EXHIBIT "C"
ERDF CELLS 9& 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A. - SCHEDULE OF QUANTITIES AND PRICES

1.0 WORK TO BE PERFORMED - SUBCONTRACTOR shall furnish trained and qualified labor, materials, equipment, tools, supplies, transportation, facilities, technical and professional services, management, supervision, and other necessary articles; and performance of operations and incidental activities necessary to complete the construction quality assurance (CQA) activities for the construction of ERDF Super Cells 9 & 10 in accordance with the Subcontract Documents.

2.0 LUMP SUM AND UNIT PRICES - The lump sum and unit prices herein for performing Work are firm and fixed for the duration of the Subcontract and are not subject to escalation for any cause, including, but not limited to, wage escalation, fuel escalation, etc. Payment of lump sum and unit prices shall constitute full compensation for performance of the corresponding work and shall cover direct costs; indirect costs; overhead costs; profit; and general and administrative expenses of whatever nature, incurred by the SUBCONTRACTOR in accomplishing the work in accordance with the provisions of the Subcontract Documents.

Progress payments will be paid in accordance with Exhibit "B" SC 3.3 *Measurement for Payment and Payment for Work*. Work completed for Lump Sum Pay Items each month will be measured for payment as a percentage of the total work completed for the Pay Item. CONTRACTOR and SUBCONTRACTOR will negotiate the value of the SUBCONTRACTOR performance for each monthly progress payment. Thus paid, the lump sum amount will constitute full compensation for work covered under the Pay Item.

The following activities shall be considered incidental to the pay items described below and shall not be paid separately. The Subcontractor must proportionally allocate these activities to each pay item:

- Incidental job burdens
- Attendance at meetings specified in Subcontract documents
- General home office expenses commonly known as G&A
- Management, supervision, and maintenance including, but not limited to, project superintendents, Quality Assurance/Site Safety Officers, office personnel, timekeeping and maintenance mechanics, etc.
- Housekeeping
- Other work necessary to successfully complete the Scope of Work under this Contract, including support to the Construction Subcontractor for preparation of Work Packages in accordance with the IWCP process.
- IWCP implementation.
- Progress As-Built Drawings and Specifications

3.0 ESTIMATED QUANTITIES FOR UNIT RATES - The SUBCONTRACTOR understands and agrees that any or all of this work may or may not be authorized, and that neither the CONTRACTOR nor the OWNER warrants that any or all of the work will be authorized. The SUBCONTRACTOR further understands and agrees to perform any portion of each item of authorized work at the stated unit price, which shall constitute full payment for authorized work.

EXHIBIT "C"
ERDF CELLS 9& 10 CONSTRUCTION QUALITY ASSURANCE (CQA)
FORM A. - SCHEDULE OF QUANTITIES AND PRICES

CONTRACTOR approval is required prior to exceeding any estimated quantity otherwise the SUBCONTRACTOR risks not being reimbursed for the overage.

4.0 FUNDING LIMITATIONS - Total payments under this Subcontract shall not exceed the estimated value of this Subcontract without a written Amendment to the Subcontract.

EXHIBIT "C"
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8	CQAP, Table 4-2.1 <i>See Note (1)</i>	HDPE Geomembrane Monitoring	Lump Sum	1		
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14	Exhibit D, 2.1.2 CQAP, 4.7	Leachate Storage Tank #3 Monitoring & Testing	Lump Sum	1		
15	Exhibit D, 2.1.2 CQAP, 4.7	Leachate Storage Tanks #1 & #2 Liner Monitoring & Testing	Lump Sum	1		
16	Exhibit D, 2.1.4	Acceptance Testing	Lump Sum	1		
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19	Exhibit D, 2.1.7	Receiving Inspections	Lump Sum	1		
20	Exhibit D, 2.1.8	Review Construction Subcontractor's Submittals	Lump Sum	1		
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23	Exhibit B, SC 6.8	Safety Incentive	Quarter	7	See Exhibit B, SC 6.8	(b)(4)
Subtotal for Pay Items 1 - 23 (including applicable taxes)						\$1,638,000.00

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S.5	ASTM D 6938	In-Place Density and Water Content	Test	50	
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Subtotal for Supplemental Work Items S.1 – S.13 (including applicable taxes)					(b)(4)
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The CONTRACTOR makes no guarantee that the number of tests and hours listed will be required. The rates provided will be used for pricing of adjustments if any changes are required in the Subcontract Scope of Work.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP			
1. <input checked="" type="checkbox"/> Work may proceed. 2. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4. <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5. <input type="checkbox"/> Permission to proceed not required.			
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.			
	ONLY ARCHITECTURAL/GEOTECHNICAL	ELECTRICAL	MECHANICAL
	PROCESS/NUCLEAR	CHDD	PROJECT REP.
	ENVIRONMENTAL	WASTE MANAGEMENT	SAFETY
	INDUSTRIAL HYGIENE	FIRE PROTECTION	QA
	PAVCON	FIELD ENGINEER	OTHER
CHECK REVIEW REQUIREMENT			<input checked="" type="checkbox"/>
REVIEWED BY		<i>WB</i>	
<i>W.A. Balay</i> Project Engineer		<i>11-24-2009</i> Date	
DOCUMENT ID NUMBER			
<i>S06X524A000CN03-05-017-001</i>			
SC/P.O. No.	SSRS ITEM	SUBMITTAL	

WCH-DE-432 (11/15/2007) 20702651

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

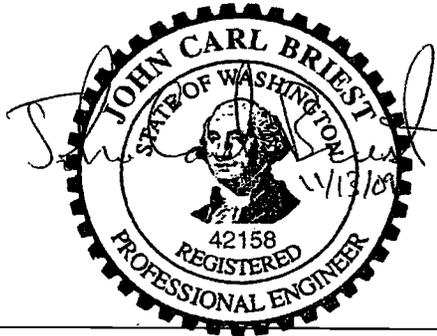
FOR ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) CELLS 9 & 10

RECEIVED

NOV 19 2009

DOCUMENT CONTROL *mjp 11/24/09*

WCH - DOCUMENT CONTROL



Rev	Date	Reason for Revision	Originator	Checker	Project Engineer	HEAD Design Eng
0	11/13/09	Issued for Award	<i>MRH</i>	<i>BZA</i>	<i>MB</i>	<i>SCB</i>
Washington Closure Hanford, LLC		RIVER CORRIDOR CLOSURE CONTRACT		Job No. 14655	Contract No. 0600X-QA-G0005	
				Page 1	of 51	

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP) CONTENTS

1.0	INTRODUCTION	4
1.1	PURPOSE	4
1.2	SCOPE	4
1.3	RELATIONSHIP TO WCH'S QUALITY ASSURANCE PROGRAM	5
1.4	CHANGE CONTROL PROCEDURES	5
2.0	PROJECT ORGANIZATION	5
2.1	RESPONSIBILITY AND AUTHORITY	6
2.1.1	Owner	6
2.1.2	Permitting Agencies	6
2.1.3	River Corridor Closure Contractor	6
2.1.4	Operations Subcontractor	7
2.1.5	QA/QC	7
2.1.6	Construction Manager	7
2.1.7	Engineering STR	7
2.1.8	Designer	7
2.1.9	Construction STR	7
2.1.10	CQA STR	8
2.2	PROJECT MEETINGS	9
2.2.1	CQA/Construction Coordination Meeting	9
2.2.2	Plan of the Day Meetings	10
2.2.3	Weekly Progress Meetings	10
2.2.4	Non-Conformance Meetings	11
2.3	HOLD POINTS	11
3.0	PERSONNEL QUALIFICATIONS AND TRAINING	11
3.1	CQA OFFICER	11
3.2	CQA ENGINEER	12
3.3	CQA FIELD PERSONNEL	12
4.0	INSPECTION ACTIVITIES	12
4.1	EARTHWORKS	13
4.1.1	Excavation	13
4.1.2	Fill	13
4.2	ADMIX SOIL LINER	14
4.2.1	Pre-Construction	14
4.2.2	Test Fill	15
4.2.3	Construction	17
4.2.4	Post Construction	19
4.3	GRAVEL DRAINAGE LAYERS	20
4.3.1	Post-Construction	20

4.4	OPERATIONS LAYER	20
4.4.1	Construction.....	20
4.4.2	Post-Construction.....	21
4.5	ANCHOR, UTILITY, AND SIDE SLOPE RISER PIPE TRENCHES.....	21
4.5.1	Construction.....	21
4.5.2	Post-Construction.....	22
4.6	HDPE GEOMEMBRANE LINER	22
4.6.1	Preconstruction	22
4.6.2	Construction.....	24
4.6.3	Post-Construction.....	30
4.7	LEACHATE COLLECTION SYSTEM (LCS).....	30
4.7.1	Pre-Construction	31
4.7.2	Construction.....	31
4.7.3	Post-Construction.....	36
5.0	DOCUMENTATION	36
5.1	DAILY REPORTS.....	36
5.2	INSPECTION DATA SHEETS	38
5.3	NONCONFORMANCE REPORTING.....	38
5.4	DESIGN CHANGES AND CLARIFICATIONS	39
5.5	PROGRESS REPORTS.....	39
5.6	FINAL DOCUMENTATION.....	40
5.7	STORAGE OF RECORDS.....	40
6.0	REFERENCES	40

TABLES

TABLE 4-1.	SOIL MINIMUM TESTING REQUIREMENTS.....	45
4-1.1	EARTHWORK.....	45
4-1.2	ADMIX SOIL LINER.....	46
4-1.3.	GRAVEL DRAINAGE LAYERS.....	47
4-1.4	OPERATIONS LAYER.....	47
4-1.5	ANCHOR TRENCH/SIDE SLOPE RISER PIPE TRENCH.....	47
TABLE 4-2.	GEOSYNTHETIC MATERIALS MINIMUM TESTING REQUIREMENTS	48
4-2.1.	HDPE GEOMEMBRANE	48
4-2.2	GEOTEXTILE.....	49
4-2.3.	GEOCOMPOSITE	49
4-2.4	GEONET	50
TABLE 4-3.	ERDF CONSTRUCTION HOLD POINTS	51

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) has contracted with Washington Closure Hanford, LLC (WCH) to construct two additional cells (Cells 9 & 10) at the Environmental Restoration Disposal Facility (ERDF) on the Hanford site near Richland, Washington. Cells 9 & 10 will be constructed adjacent to the existing cells and the liner systems will be joined to form a single uninterrupted liner system. This Construction Quality Assurance Plan (CQAP) describes the construction quality assurance activities required during the construction of Cells 9 & 10.

1.1 PURPOSE

During facility construction, Construction Quality Assurance (QA) activities will be required to ensure that:

- (1) Components are constructed in accordance with the plans and specifications; and
- (2) Requirements of agencies related to documentation are satisfied. The agencies involved with ERDF are the DOE and the U.S. Environmental Protection Agency (EPA).

This CQAP has been prepared to describe the activities that will be performed during construction to satisfy these objectives. Procedures invoked by the CQAP are intended to identify problems that may occur during construction and to document that these problems are corrected before construction is complete.

This CQAP is intended to satisfy the regulatory requirements and guidance established in 40 CFR 264.19 (EPA), WAC 173-303-335 (Ecology), and EPA/600/R-93-182 *Quality Assurance and Quality Control for Waste Containment Facilities, 2nd Edition, Waste Containment Facilities, ASCE Press, 2007.*

This CQAP is to function and be executed independently of the Construction SUBCONTRACTOR's Construction Quality Control (CQC) program, except when nonconformance in the Construction SUBCONTRACTOR's program or product are identified. The Construction SUBCONTRACTOR's CQC activities during construction, including test methods, location, frequency, and similar requirements, are defined in the Technical Specifications for the construction subcontract and are not modified in any way by this CQAP.

1.2 SCOPE

This CQAP establishes general administrative and documentation procedures. With respect to specific inspection and testing activities, this plan addresses only those activities associated with construction of the disposal trench and the support facilities that will be performed for Cells 9 & 10. Specific work items include:

- Excavation
- Soil testing
- Construction of admix soil liner test fill
- Production and placement of admix soil liner
- Construction of anchor trenches and side slope riser trenches
- Procurement, testing, and installation of geosynthetics
- Installation of components and facilities for leachate collection and removal system and utility zone monitoring system
- Placement of gravel drainage layers
- Placement of the operations layer
- Site grading (civil survey, layout, etc)

1.3 RELATIONSHIP TO WCH'S QUALITY ASSURANCE PROGRAM

This CQAP and the CQA SUBCONTRACTOR's Quality Assurance Program (QAP) are secondary documents, developed under the requirements of the project QA program embodied in the current approved versions of the *River Corridor Closure Contract Quality Assurance Program Description (QAPD)*, (WCH-51). The QAPD is the site-wide River Corridor Closure Contractor's quality assurance document. The CQAP draws upon the records management, document control, technical review, and other procedural resources invoked by the QAPD.

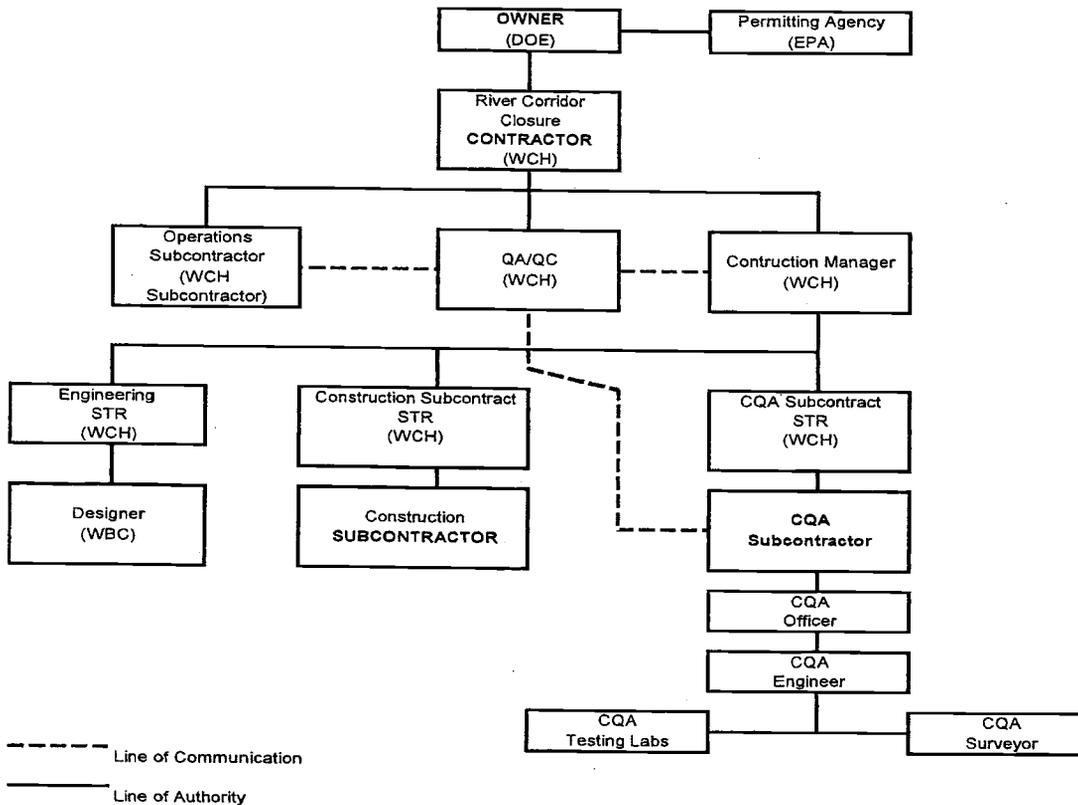
1.4 CHANGE CONTROL PROCEDURES

The CQAP and implementing procedures are subject to the change control requirements defined by the procedures established in WCH's QAPD.

2.0 PROJECT ORGANIZATION

This section describes the project organization for the construction of the ERDF Cells 9 & 10. The following sub-sections address the organizations involved in the ERDF construction, their respective roles in construction activities, and methods of interactions between organizations.

Figure 1. ERDF Construction/Quality Assurance Organization



2.1 RESPONSIBILITY AND AUTHORITY

The quality assurance organization chart for ERDF construction is shown on Figure 1. Each major organization is described in the following sections.

2.1.1 Owner

The OWNER of the ERDF is the DOE - Richland Operations Office (DOE).

2.1.2 Permitting Agencies

Cells 9 & 10 of the ERDF are being constructed to meet regulations established by the EPA. This CQAP is specifically designed to support those regulations.

2.1.3 River Corridor Closure Contractor

WCH is the River Corridor Closure Contractor for ERDF and is responsible for design, construction, and operation of the ERDF. WCH interfaces with DOE and the regulatory agencies and is responsible for ensuring that the permitting requirements of the regulatory

agencies are satisfied. WCH manages the activities of the Designer, Construction SUBCONTRACTOR, (SUBCONTRACTOR) and CQA SUBCONTRACTOR. These three activities may be conducted by different subcontractors to maintain the required degree of independence. WCH has procurement authority for ERDF Subcontracts.

2.1.4 Operations Subcontractor

The ERDF is operated by WCH for the DOE. WCH has subcontracted the operation of ERDF to an Operations Subcontractor. During construction, WCH will be responsible for review and approval of any field changes which would affect facility operations.

2.1.5 QA/QC

WCH provides quality assurance and quality control (QA/QC) oversight of the SUBCONTRACTOR and CQA SUBCONTRACTOR'S activities during construction.

2.1.6 Construction Manager

The Construction Manager, an employee of WCH, has overall responsibility for construction of the ERDF cells. The Construction Manager directs the activities of the construction project and personnel, including the Engineering Subcontract Technical Representative (STR), Construction STR, and CQA STR.

2.1.7 Engineering STR

The Engineering (STR), an employee of WCH, serves as the point of contact between the Designer and WCH. The Engineering STR oversees the preparation and review of technical documents related to the design of ERDF Cells 9 & 10.

2.1.8 Designer

ERDF Cells 9 & 10 were designed by WCH through their subcontractor, Weaver Boos Consultants, LLC (WBC). The responsibilities of the Designer include clarifying and interpreting the plans and specifications, assisting with the preparation of Design Change Notices (DCNs), incorporation of new or changed requirements, and reviewing submittals as directed by the Engineering STR. The Designer may also assist with document distribution and control if directed by the Engineering STR.

2.1.9 Construction STR

The Construction STR, an employee of WCH, serves as the point of contact between the Construction SUBCONTRACTOR and WCH. The Construction STR oversees the daily construction field activities and is the on site representative for WCH.

2.1.9.1 Construction SUBCONTRACTOR. The Construction SUBCONTRACTOR (SUBCONTRACTOR) performs the work activities associated with actual construction of ERDF.

Cells 9 & 10. The SUBCONTRACTOR is responsible for implementing their own internal QC activities as defined in the Construction Subcontract, approved submittals, and other supporting documentation. The SUBCONTRACTOR reports directly to and receives direction from the WCH Construction STR. This document also refers to an Installer. The Installer is a subtier under the Construction SUBCONTRACTOR and refers to the geosynthetics installer.

2.1.10 CQA STR

The CQA STR, an employee of WCH, serves as the point of contact between the CQA Subcontractor and WCH. The CQA STR oversees the daily CQA field activities and is the on site representative for WCH.

2.1.10.1 CQA Subcontractor. A third-party CQA subcontractor shall perform the work specified in the CQAP. The CQA Officer, an employee of the CQA Subcontractor, has the overall responsibility of implementing the CQAP and directly supervises the on site CQA Engineer. The CQA Officer shall be a Registered Professional Engineer in the State of Washington and has the authority to provide certification that the ERDF cells were constructed in accordance with the Permitting Agency-approved CQAP and construction Technical Specifications and Drawings.

The CQA Subcontractor shall review the SUBCONTRACTOR'S plans and other submittals, as required by the CONTRACTOR. The CQA Subcontractor shall also be responsible for training and qualifying CQA inspection personnel on requirements, procedures, scheduling, and inspection activities, and ensuring that the CQA testing laboratories and surveyors conform to CQA Subcontract requirements. The CQA Subcontractor shall ensure that sample custody procedures are followed and test data are accurately reported and maintained for preparation of periodic reports. The most important duty of the CQA Subcontractor is confirming that the facility was constructed in accordance with plans and specifications approved by the permitting agency. The CQA Subcontractor shall report directly to and receive direction from the CQA STR.

2.1.10.2 CQA Engineer. The CQA Engineer works on site under the direction of the CQA Officer and manages the on site quality assurance personnel and CQA work; location and frequency of tests, schedule and monitor results of tests, identify deficiencies and verify that deficiencies have been corrected, complete reports and provide peer review of completed data, testing, and oversight activities. CQA field personnel work under the direction of the onsite CQA Officer and perform testing and observations in accordance with the CQAP.

2.1.10.3 CQA Testing Labs. CQA testing labs conduct the CQA tests specified in the CQAP that are not completed on site. CQA Testing labs shall be provided by the CQA Subcontractor.

2.1.10.4 CQA Surveyor. The CQA Surveyor shall provide surveys necessary for conducting the work specified in the CQAP. The CQA Surveyor shall be provided by the CQA Subcontractor. CQA surveying work shall be performed under the direction of a registered professional land surveyor in the State of Washington.

2.2 PROJECT MEETINGS

This section includes a discussion of various progress and status meetings to be held throughout construction activities. The intent of the meetings is to ensure communication between organizations involved in the construction of ERDF cells.

2.2.1 CQA/Construction Coordination Meeting

A meeting will be held to resolve any uncertainties following the award of the Construction and CQA Subcontracts. The meeting will include the organizations involved in the Construction and CQA activities, including representatives of DOE and regulatory agencies as agreed upon. The topics of this meeting will include but are not limited to:

- Reviewing the responsibilities of each organization;
- Integrated work control;
- Interface protocol (e.g. points of contact, notification process, etc.);
- Reviewing lines of authority and communication for each organization;
- Providing each organization with CQA documents and supporting information;
- Familiarizing each organization with the CQAP and its role relative to the design criteria, plans, and specifications;
- Determining any changes to the CQAP that may be needed to document that the facility will be constructed to meet or exceed the specified design requirements;
- Discussing the established procedures or protocol for observations and tests including sampling strategies;
- Discussing the established procedures or protocol for handling construction deficiencies, repairs, and retesting, including “stop work” conditions;
- Reviewing methods for documenting and reporting inspection data;
- Reviewing methods for distributing and storing documents and reports;
- Reviewing work area security and safety protocol;
- Reviewing the proposed project schedule;

- Discussing procedures for the location and protection of construction materials and for the prevention of damage of the materials from inclement weather or other adverse events; and
- Conducting a site walk-around to review construction material and inspect equipment storage locations.

The meeting will be documented in the CQA Subcontractor's meeting minutes.

2.2.2 Plan of the Day Meetings

CQA representative(s) shall attend the Construction SUBCONTRACTOR's daily Plan of the Day meetings at the work site. The purpose of the meetings is to:

- Discuss any health and safety issues;
- Review the previous day's activities and accomplishments;
- Review the work location and activities for the day;
- Discuss the SUBCONTRACTOR's personnel and equipment assignments for the day;
- Review any new test data; and
- Discuss any potential construction problems.

2.2.3 Weekly Progress Meetings

CQA representative(s) shall attend the CONTRACTOR's weekly progress meetings with the Construction SUBCONTRACTOR. The purpose of the meetings is to:

- Review the previous weeks activities and accomplishments;
- Review claims, change orders, delays, and similar items;
- Review planned activities for the upcoming week;
- Review project schedule, including but not limited to, project schedule and hold point schedule;
- Finalize resolution of problems from the previous week; and
- Discuss the potential problems with the work planned for the upcoming week.

This meeting's minutes will be documented by the CONTRACTOR.

2.2.4 Non-Conformance Meetings

Meetings will be convened as necessary to address non-conformance discovered during inspection. Deficiencies observed during construction by CQA personnel will be brought to the attention of the CONTRACTOR's STR and the Construction SUBCONTRACTOR. The Construction SUBCONTRACTOR shall document and disposition the non-conformance in accordance with the Construction SUBCONTRACTOR's Non-Conformance Reporting (NCR) procedures. The CQA Subcontractor and Designer will participate in nonconformance review meetings as requested by the WCH.

2.3 HOLD POINTS

Hold points are established for certain key activities as identified in Table 4-3. At these points, the SUBCONTRACTOR shall cease work on the affected activity until it has been reviewed by the appropriate CQA personnel. The Construction SUBCONTRACTOR shall provide CQA personnel at least one week notice prior to a hold point inspection.

3.0 PERSONNEL QUALIFICATIONS AND TRAINING

This section describes the qualifications and training required for CQA personnel.

The CQA Subcontractor shall develop and submit a Training Matrix for each position required for performance of work on the CQA Subcontract. The CQA Subcontractor is responsible for qualification, certification, and maintenance of these requirements for the personnel fulfilling these positions. The CQA Subcontractor shall submit a certification form documenting the qualifications of CQA personnel to the CONTRACTOR.

3.1 CQA OFFICER

The CQA Officer shall have landfill construction certification experience. The CQA Officer shall possess, as a minimum, a Bachelor's degree and Washington State Professional Engineer license in civil or construction engineering, engineering geology, or a closely related discipline, and shall have at least 10 years practical, technical, and managerial experience to successfully direct the CQA activities discussed in this plan. The CQA Officer's qualifications shall be documented by training records, copies of licenses, and professional resume.

The CQA Officer shall receive training in the requirements of the CQAP and the CQA Subcontractor's QAP, including but not limited to documentation, receiving inspection, equipment calibration, design control, and personnel training. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

3.2 CQA ENGINEER

The CQA Engineer shall possess, at a minimum, a Bachelor's degree in civil or construction engineering, engineering geology, or a closely related discipline, and shall have sufficient practical, technical, and managerial experience to successfully direct the on-site CQA activities specified in this CQAP. The CQA Engineer's qualifications shall be documented by training records, copies of licenses, and professional resume.

The CQA Engineer shall receive training in the requirements of the CQAP and the CQA Subcontractor's QAP, including but not limited to documentation, receiving inspection, equipment calibration, design control, and personal training. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

3.3 CQA FIELD PERSONNEL

CQA field personnel shall possess a high school diploma and at least two years of construction-related experience, including at least one year of experience conducting CQA monitoring for earthworks and geosynthetics installation, or a Bachelor of Science degree from a four year college or university and at least one year of experience conducting CQA monitoring for earthworks and geosynthetics installation.

Qualifications of CQA Personnel shall be documented by training records and professional resumes. Prior to undertaking project activities, CQA Personnel shall receive training in the requirements of the CQAP, the CQA Subcontractor's QAP, and applicable technical requirements. In addition, CQA Personnel shall be trained in the use of visual-manual soil classification techniques. Project plans and specifications shall be reviewed. The purpose of the training is to provide CQA staff with a clear understanding of expected conditions, methods of construction, and the scope of plans and specifications. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

4.0 INSPECTION ACTIVITIES

This section describes the inspection activities (observations and tests) that will be conducted by the CQA Subcontractor during construction of the ERDF trench and support facilities. The following subsections address each facility component separately and, if appropriate, are further subdivided into sections on pre-construction, construction, and post-construction testing and observation activities unique to each component. Soil testing requirements are summarized in Table 4-1. Geosynthetic testing requirements are summarized in Table 4-2. Hold points during construction are summarized in Table 4-3.

Sampling of soil, geosynthetic materials, and other materials will be required for testing purposes. Every sample shall be assigned a unique identification number which describes the sample location and type. Sample numbers shall be recorded by the CQA Subcontractor.

4.1 EARTHWORKS

4.1.1 Excavation

Requirements for excavation activities are described in Exhibit "D" Scope of Work, Technical Specifications, and Drawings. During excavation, CQA Personnel shall generally observe the excavated material and subgrade conditions and shall perform the following activities:

- Document moisture seeps and that soft, organic, and otherwise undesirable materials are removed.
- Notify the CONTRACTOR immediately if changed or unexpected geologic conditions are encountered.
- Coordinate with the CQA Surveyor to confirm that the depth and slope of the excavations, sumps, ramps, side slope riser trenches, surface water drainage ditches, roadways, foundations, and other construction components meet design requirements.

Observations shall be recorded on daily field monitoring report forms, drawings, and geologic maps as appropriate.

4.1.2 Fill

Requirements for fill are described in Exhibit "D" Scope of Work, Technical Specifications, and Drawings. CQA Personnel shall perform the following activities:

- Prior to placement of any structural backfill or roadway top course material in the trench or on the embankment, verify that the subgrade has been prepared (scarified, moisture-conditioned, and compacted) in accordance with the requirements of the Technical Specifications. CQA Personnel shall test the subgrade with in-place density methods at the frequency specified in Table 4-1.
- During fill and roadway top course placement in the trench or on the embankment, conduct tests and observations to document that the quality of compacted fill meets project specifications. This will include visual observation, measurement of lift thickness, verifying grain size analysis, determining moisture-compaction characteristics, and measuring in-place density and moisture content, and other tests. Field in-place density tests shall be conducted at a listed in Table 4-1. Additional tests may be conducted at the discretion of the CQA Officer.
- Coordinate with the CQA Surveyor to verify that final lines and grades conform to design requirements.
- Review SUBCONTRACTOR's soil testing and field density data to verify that materials satisfied the requirements of the Technical Specifications and that specified compaction was achieved.

Observations shall be recorded on daily field monitoring report forms, drawings, and test data forms.

Provide a daily report to the CQA STR that contains, at a minimum, fill quantities, locations, observations, problems, NCRs, deficiencies, CQA hold points witnessed/released, and observed safety issues. The report shall be submitted on the following work day.

4.2 ADMIX SOIL LINER

The requirements for the admix soil liner are described in Specification No. 0600X-SP-C0076, Cell Construction-Admix Layer, of the Technical Specifications. The CQA Personnel shall perform the following activities:

4.2.1 Pre-Construction

Preconstruction CQA activities include review of bentonite manufacturer certificates, inspection and testing of base soil preparation, inspection and testing of admix soil liner preparation, and inspection and testing of test fill construction. Each is described below:

Base soil liner materials shall be inspected to document that they satisfy the requirements of the specifications. Material inspection shall continue throughout the liner construction period. If base soil material for admix production is obtained onsite, the inspections can be performed as the material is excavated or as it is placed in the storage pile. Visual observation and classification of the excavated base soils used in admix production shall be performed. Unsuitable material shall be rejected. If base soil material for the admix layer material is obtained offsite, inspection of the soil shall be conducted as it arrives at the construction site. For borrow areas containing non-uniform materials, unacceptable soil material shall be segregated as it is excavated. CQA Personnel shall observe segregation operations carefully and document that suitable material is retained for liner construction. Changes in color or texture may be indicative of a change in soil type or soil moisture content. The soil shall be inspected for roots, stumps, large rocks, and other deleterious materials. No rocks greater than 2 inches will be allowed in the admix layer.

During mixing, CQA Personnel shall observe production and shall test the admix to document that the specified amount of bentonite is mixed uniformly with the base soil, and that water is uniformly added to the admix in the amount necessary to achieve the specified design. The bentonite content of the admix liner material shall be determined by belt scale measurements and sieve analysis.

A sufficient number of samples of the constituent materials and finished admix, as determined by the CQA Officer, shall be tested to document that material properties are within the ranges stated in the specifications. These tests shall include at least the following:

- Bentonite yield manufacturer's certificates – as indicated in Table 4-1.

- Remolded Permeability (Admix) – as indicated in Table 4-1. Additional permeability testing shall be performed whenever the base soil has < 20% passing the U.S. No. 200 Sieve by dry weight. For this testing, the base soil shall be mixed with 12% bentonite by dry weight and have moisture – density values that fall within the “acceptable zone”, as described in Specification 0600X-SP-C0076. If the permeability results are comparable to those with base soil containing > 20% fines, the base soil may be used. Otherwise, it shall be rejected.
- Soil density/moisture content relationships (Admix) – as indicated in Table 4-1.
- Maximum clod size (Admix) - Periodic visual monitoring.
- Particle size distribution (base soil and admix) (hydrometer and - #200 sieve) – as indicated in Table 4-1.
- Bentonite content of admix by belt scale measurements – as indicated in Table 4-1.
- Atterberg limits (Admix) – as indicated in Table 4-1.
- Natural water content (Admix) – as indicated in Table 4-1.
- Soil Density/Moisture Content Relationship (Admix) – as indicated in Table 4-1.

Samples shall be collected and tested by CQA Personnel. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1. Testing shall be completed and compliance with the specifications established prior to any placement of admix material. Additional samples totaling at least 200 pounds shall be collected by the CQA Personnel and archived at the direction of the CONTRACTOR. The CONTRACTOR shall hold archive samples at their discretion. If the admix properties change due to changes in the base soil or other factors, the CONTRACTOR may change the acceptable moisture and density.

4.2.2 Test Fill

A test fill shall be constructed by the SUBCONTRACTOR to demonstrate the adequacy of the materials, design, equipment, and construction procedures proposed for the admix liner. The primary purpose of the test fill is to document that the specified soil density, moisture content, and permeability values can be achieved consistently in the full-scale facility with the full-scale compaction equipment and procedures.

The test fill shall be constructed to allow determination of the relationship among density, moisture content, and permeability. Field variables can affect this relationship and must be carefully measured and controlled both in the test fill and during construction of the full-scale liner. As a minimum, the following shall be observed, sampled, tested, and documented by the CQA Personnel:

- The compaction equipment type, configuration, and weight

- The number of passes of the compaction equipment
- The method used to breakdown clods before compaction and the maximum allowable clod size
- The method used to control and adjust moisture content, including equilibration time, and the quantity of water to be used in any adjustment
- The speed of the compaction equipment traveling over the liner
- The uncompacted and compacted lift thicknesses
- Types of rutting (depths, widths, etc.).
- Relatively undisturbed samples of the test fill shall be collected by the CQA Subcontractor using Shelby tubes for laboratory permeability tests. The Construction SUBCONTRACTOR will assist in collecting the Shelby tubes.
- Following collection of permeability samples, the holes shall be repaired and the methodology for repairing holes in the soil liner shall be evaluated by CQA Personnel. Holes less than or equal to 2 inches in diameter shall be repaired by backfilling with admix liner or bentonite chips, pellets, or powder in lifts no more than 6 inches thick and hand-tamping with a steel rod or other suitable device to firmly compact each lift. The methods and materials that will be used in the repair process shall be documented by CQA Personnel. Performance of repaired soil liner sections shall be equal to or exceed the performance of undisturbed liner sections. The resulting procedures shall be followed during repair of testing or sampling holes during full-scale liner construction.
- The test fill construction shall include the removal and replacement of a portion of the soil liner to evaluate the method proposed for repair of defective portions of the full-scale liner.
- A Two Stage Borehole (Boutwell) Test (ASTM D6391) shall be performed on the test fill to evaluate large-scale permeability. The Two Stage Borehole (Boutwell) Test shall be installed by the CQA Subcontractor, CQA Personnel shall direct installation of the equipment, perform the test, and evaluate the data with support from the SUBCONTRACTOR.
- Evaluation of layer bonding shall be determined by CQA Personnel using test pits to make visual observations. A minimum of two test pits shall be excavated in each test fill after test fill construction has been completed. The test pits shall be excavated entirely through the test fill using a backhoe, post hole digger or other approved method. Test pit locations shall be determined by CQA Personnel. Test pits will be completed by SUBCONTRACTOR.

The number and frequency of field and laboratory tests to be conducted during the test fill are listed below:

Additional tests may be conducted at the direction of the CQA Officer. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1. The CQA Officer shall compare the results of field and laboratory testing to the required specifications. Any failing tests shall be reported to the CONTRACTOR.

Additional test fills shall be constructed for each borrow source and whenever significant changes occur in the liner material, equipment, or procedures used to construct the soil liner.

4.2.3 Construction

Low-permeability admix liner shall be constructed by using the materials equipment and procedures used in the test fill and as documented by CQA Personnel. Criteria to be used for determining the acceptability of the liner shall be as identified in the project specifications. The CQA process for admix liner are intended to accomplish three objectives:

1. Ensure that the admix liner materials are suitable.
2. Ensure that the admix liner materials are properly placed and compacted.
3. Ensure that the completed liner is properly protected.

Subgrade preparation shall be observed for compliance with the specifications.

To document that proper construction practices are followed, CQA Personnel shall observe the liner material placement and compaction process. During material spreading, the following shall be documented:

- Area to be covered is lightly scarified and moisture conditioned to facilitate bonding;
- Liner material is spread adequately to obtain complete coverage and the specified loose lift thickness;
- Equipment used to transport material does not affect lower material that was previously scarified;
- Oversize clods in the liner material are discarded or reduced in size;
- Soil moisture content is adjusted appropriately in the event of a significant prolonged rain or drought during construction;
- When required, water is adequately spread and incorporated to obtain full penetration through clods and uniform distribution;

- Significant water loss and desiccation cracking before and after compaction are prevented through the use of water application, covering, or other appropriate methods; and
- At tie-in locations, any dry, cracked, or otherwise unsuitable areas of the existing admix is removed.

During the soil liner compaction process, the following shall be documented:

- Compaction equipment is of the same type, configuration, and weight as used in the test fill;
- The equipment speed and number of passes for compaction is the same as used in the test fill;
- Coverage by compaction equipment is uniform, especially at compacted fill edges, in equipment turnaround areas, and at the tops and bottoms of slopes;
- The specified soil density, water content, and permeability throughout each completed lift is achieved. This will be determined by laboratory and field testing;
- Hydraulic Conductivity values obtained for undisturbed soil liner samples are consistent with values obtained for undisturbed samples from the test fill. Undisturbed sample locations are staggered from lift to lift so holes do not align vertically;
- Penetrations or holes resulting from the collection of undisturbed soil samples or the use of density or moisture probes are repaired using the same materials and methods used for repairs on the test fill. CQA personnel shall repair all holes resulting from CQA sampling or testing activities;
- Repaired sections are tied-in with undisturbed sections of the liner;
- Compacted lifts are tied together by scarifying the top of each lift, if necessary, with appropriate equipment prior to applying the following lift;
- Newly placed material is thoroughly kneaded into existing admix at tie-in locations;
- Sufficient liner strength to maintain stable sidewalls and to supply a stable base for supporting overlying materials is maintained while achieving the minimum specified density. This shall be monitored with moisture-density testing in accordance with the procedures listed in Table 4-1. In place field density tests and moisture content tests shall be conducted at a frequency as listed in Table 4-1. Additional tests may be conducted as directed by the CQA Officer. If a nuclear density gauge is used to measure the in-place density of the admix, then at least one rubber balloon, drive cylinder, or sand cone density test shall be conducted per day to confirm the results of the nuclear gauge.

Moisture content measured with the nuclear gauge shall be validated by collecting a minimum of one sample per day for laboratory moisture determination. ASTM D4643 (microwave moisture content) may be used after a reliable correlation between oven dried (ASTM D2216) and microwave results is established;

- Protective covers to prevent desiccation of liner material after completion of the liner are placed in a timely manner where necessary; overbuilding the liner can be considered protective cover; and
- Equipment traffic is routed and controlled such that accidental damage of installed portions of the soil liner is prevented.

Climatic conditions shall be considered when construction methods are chosen. Construction methods may be restricted on work performed during and just after a rainfall, during very hot or windy conditions, or during freezing weather. For example, more compactive effort must sometimes be applied to achieve the same density as soil temperature falls. In very dry weather, the surface water content of each compacted fill layer can be altered in a short time by drying, making continuous watering and blending necessary. Atmospheric conditions shall be observed and recorded by CQA Personnel, and appropriate actions shall be taken when unsuitable weather conditions exist.

At locations where the field testing indicates that moisture contents or densities are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

Shelby tube samples of the in place soil liner shall be obtained at a minimum frequency as listed in Table 4-1 for material placed. The testing frequency shall be increased if the admix material changes significantly. At any time, additional samples may be obtained at the discretion of the CQA Officer or CQA Engineer. At least one sample shall be taken from a corner area. Laboratory Hydraulic Conductivity tests shall be conducted on these samples to document compliance with the specifications.

The CQA Engineer shall monitor on a periodic basis the soil liner surface for desiccation and irregularities to document compliance with the specifications. The completed liner shall be protected from desiccation, erosion, and freezing following completion of the uppermost lift.

4.2.4 Post Construction

Immediately before placement of any geomembrane, the soil liner shall be inspected for cracks, holes, defects, or any other features that may increase its permeability. Defective areas shall be repaired. If the underlying foundation is defective (e.g., soft or wet), then this material shall be removed and the resultant volume replaced. Excavated areas of the soil liner shall be repaired by the method demonstrated during test fill construction; inspection shall document that there is continuity between the repaired and undisturbed areas.

Special attention shall be paid to the final inspections of the sump area, sidewall and bottom slopes, liner coverage, and liner thickness. The CQA Engineer shall coordinate with the CQA Surveyor to confirm that minimum design thicknesses and grades are achieved prior to placement of any additional material over the soil liner.

4.3 GRAVEL DRAINAGE LAYERS

The requirements for the gravel drainage layers are described in 0600X-SP-C0078, Cell Construction, of the Specifications. The CQA Personnel shall perform the following activities:

- Visually observe the material for contamination by debris or deleterious material;
- Visually observe the material for uniformity;
- Sample the material for grain size and permeability tests at a frequency as listed in Table 4-1 for material delivered to the site;
- Observe the placement of the material to confirm minimum thickness under spreading and hauling equipment to prevent damage to the underlying liner materials and components of the leachate collection system; and
- Observe placement and compaction of the material around piping and risers in the sumps.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.3.1 Post-Construction

The CQA Engineer shall coordinate with the CQA Surveyor to document that minimum thicknesses and design grades in the gravel layer have been achieved prior to the placement of any additional materials over the top of the gravel.

4.4 OPERATIONS LAYER

The requirements for the operations layer are described in 0600X-SP-C0078, Cell Construction, of the Specifications. The CQA Personnel shall perform the following activities:

4.4.1 Construction

CQA Personnel shall obtain samples of the proposed operations layer material prior to placement in the landfill. Samples shall be obtained at a frequency as listed in Table 4-1 and tested to document that the material meets the gradation requirements in the specifications. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

During placement of the operations layer material, CQA Personnel shall observe the placement operations on a full-time basis and perform the following:

- Visually observe the material for contamination with debris or deleterious material;
- Visually observe the material for particle size;
- Sample the material for grain size tests at a frequency as listed in Table 4-1 for material placed in the facility;
- Observe the placement of the material to confirm minimum thickness under equipment to prevent damage to the underlying liner materials;
- Visually observe that the operations layer placement on the slopes is conducted in compliance with the procedures outlined in the specifications;
- Visually observe to detect any damage to the underlying liner materials; and
- Visually observe the moisture conditioning, placement, and compaction of the material placed adjacent to the primary slope riser pipes.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.4.2 Post-Construction

The CQA Officer shall coordinate with the CQA Surveyor to confirm that minimum thicknesses and design grades in the operations layer have been achieved prior to the placement of any waste materials.

4.5 ANCHOR, UTILITY, AND SIDE SLOPE RISER PIPE TRENCHES

The requirements for the anchor trenches and side slope riser pipe trenches are described in 0600X-SP-C0075, Sitework, of the Specifications. The CQA Personnel shall perform the following activities:

4.5.1 Construction

CQA Personnel shall obtain samples of the proposed backfill materials for anchor trenches, utility trench and side slope riser pipe trenches prior to backfilling these trenches. Samples shall be obtained at a frequency as listed in Table 4-1 for each material or a minimum of one sample, whichever is greater. Samples shall be tested to confirm that the material meets the gradation requirements in the specifications. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

During placement of backfill in the anchor trenches, utility zone trench and riser pipe trenches, CQA Personnel shall observe the placement operations on a periodic basis and perform the following:

- Visually observe the material for contamination with debris or deleterious material;

- Visually observe the material for particle size;
- Sample the material for grain size tests at the frequency listed in Table 4-1 for material placed;
- Visually observe that the material is moisture conditioned and compacted as specified;
- Visually observe that backfill around riser pipes does not contain voids;
- Observe the placement of the material to document minimum thickness under equipment to prevent damage to the underlying materials; and
- Visually observe to detect any damage to the underlying liner materials.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.5.2 Post-Construction

There are no specific post-construction requirements for anchor trench, utility trench, side slope riser pipe trench backfill.

4.6 HDPE GEOMEMBRANE LINER

The requirements for the HDPE geomembrane liner are described in 0600X-SP-C0077, Cell Construction - Geosynthetics, of the Specifications. The CQA Personnel shall perform the following activities:

4.6.1 Preconstruction

Preconstruction activities for HDPE geomembrane liner include inspection of the raw materials, manufacturing operations, fabrication operations, and final product quality; observations related to transportation, handling, and storage of the membrane; observation of foundation preparation; and review of the personnel qualifications, training, and equipment to be used to install the HDPE geomembrane liner. In addition, CQA Personnel shall perform conformance tests on samples of the HDPE liner material submitted by the geomembrane installer. These activities are discussed in the following subsections. Samples of the geomembrane totaling at least 100 ft² shall be collected by the CQA personnel and archived by the CONTRACTOR.

4.6.1.1 HDPE Manufacture. Quality assurance requirements for the geomembrane manufacturer initially consist of evaluating the raw polymer materials. The resin supplier shall provide documentation with each shipment or production lot confirming that the raw materials comply with the manufacturers' product properties and performance requirements. The Manufacturer shall test each batch (lot) of resin to verify that the raw material meets or exceeds the specifications. The CQA Officer shall submit to the CONTRACTOR an inspection plan for the raw polymer materials in the manufacturer's facilities. The CQA Officer shall inspect the

raw polymer materials only with CONTRACTOR's approval. Any source inspection activities shall be performed in compliance with the surveillance inspection procedures and non-conformances shall be documented and submitted to the CONTRACTOR for disposition and resolution.

CQA Personnel shall review testing results and other documentation submitted by the geomembrane Manufacturer for conformance to the specification requirements. Submittals from the Manufacturer include the following:

- the origin (Resin Supplier's name, resin production plant), identification (brand name, number) and production date of the resin;
- a list of quantities and descriptions of materials other than the base polymer which comprise the geomembrane;
- a copy of the quality control certificates issued by the Resin Supplier;
- reports on the tests conducted by the Manufacturer and the CQA Laboratory to confirm that the quality of the resin used to manufacture the geomembrane satisfies the specifications;
- a statement that no recycled polymer is added to the resin or that recycled polymer is clean and does not exceed 2% by weight, and does not include material that has seen previous service life;
- a properties sheet including properties listed in the specifications, measured using test methods indicated in the specifications, or equivalent;
- reports on the tests, including sampling procedures, conducted by the Manufacturer and/or the CQA Laboratory to confirm that the geomembrane meets the project specifications; and
- a certification that property values given in the properties sheet are guaranteed by the Geomembrane Manufacturer.

4.6.1.2 Receiving Inspection and Conformance Testing. The CQA Personnel shall perform receiving inspection on geomembrane material in compliance with procedures, and nonconformances shall be documented and submitted to the CONTRACTOR for disposition and resolution. CQA Personnel shall also confirm that transportation, handling, and storage of geomembrane are performed in accordance with the specifications and manufacturer's instructions, and shall determine the condition of rolls of geomembrane upon delivery to the site.

CQA Personnel shall remove samples to be tested to determine conformance to the design specifications and the manufacturer's specifications. Samples shall be obtained and tested in accordance with the methods and frequencies listed in Table 4-1. Prior to shipment or after delivery of the rolls of geomembrane, CQA Personnel shall remove samples and forward them to

the geosynthetics testing laboratory. Samples of geomembrane shall be taken across the entire width of the roll and shall not include the first three feet. Unless otherwise specified, samples shall be three feet long by the roll width.

CQA Personnel shall examine results from laboratory conformance testing and shall notify the CONTRACTOR of any such nonconformance. Rolls of geomembrane which do not meet or exceed required specifications shall be rejected and brought to the attention of the CONTRACTOR.

4.6.1.3 Bedding Surface. CQA Personnel shall confirm that the surface upon which the geomembrane will be installed is suitably prepared and will not damage the geomembrane. Details of required observations are presented in the specifications and are summarized in the following paragraphs.

The geomembrane bedding layer shall be free of clods, rocks, sticks, sharp changes in grade, ruts greater than 1 inch, desiccation cracks, and standing water. Where the bedding surface is the low permeability admix liner, methods shall be taken to prevent the soil liner surface from drying and cracking prior to installing the geomembrane. These methods may include the use of a temporary cover. Desiccation cracks larger than the limits listed in the specifications shall be repaired using approved methods as described in the Specifications.

The Geomembrane Installer (Installer) shall inspect and provide written certification to the CONTRACTOR and the CQA Officer that the prepared surface under consideration is suitable for installation of the geomembrane.

After acceptance of the prepared surface, it shall be the Installer's responsibility to notify the CONTRACTOR and the CQA Personnel of any deterioration in the prepared surface resulting from weather or other causes beyond the Installer's control. Repairs required to restore the surface as a result of such causes shall be made as directed by the CONTRACTOR. Any damage to the prepared surface caused by installation or other causes relating to performance of the work shall be the responsibility of the SUBCONTRACTOR.

4.6.2 Construction

Sheets of geomembrane will be welded together after they are placed in the trench to form a continuous moisture barrier. CQA Personnel shall document that the placement and seaming activities are performed in accordance with the specifications; particularly that required materials, methods, and testing procedures are employed. CQA Personnel shall also review documentation submitted by the Geomembrane Installer, testing laboratories, and other parties as listed in the specifications. Seams or repaired areas which do not pass the tests shall be repaired and retested as described in the specifications until a passing result is achieved. Requirements for geomembrane installation and testing are described in detail in the specifications and are summarized in the following subsections.

4.6.2.1 Placement of Geomembranes. Prior to placing geomembranes in the landfill, the Geomembrane Installer shall provide scale drawings showing the proposed placement pattern and field seam locations to the CONTRACTOR and CQA Personnel for review.

Each field panel and field seam shall be given an identification code which is consistent with the proposed sequence of installation. A field panel is defined as the area of geomembrane which is to be cut and seamed in the field by the Installer. Unless otherwise directed, the Installer shall place the field panels in the sequence shown on the installation drawings. CQA Personnel shall verify that the geomembrane is not placed during inclement weather as specified in the Technical Specifications.

Equipment used for placement shall not damage the geomembrane or the subgrade by handling, trafficking, leakage of hydrocarbons, or in other ways. Personnel working on the geomembrane shall not engage in any activities or wear footwear which could damage the geomembrane. Direct contact of any heavy mechanical equipment with the geomembrane shall not be allowed.

Panels shall be carefully unrolled according to the Manufacturer's instructions, and in a manner that does not scratch or crimp the geomembrane. Panels shall be aligned to minimize wrinkles or "fishmouths", especially along the field seams. Adequate precautions (such as placement of sand bags) shall be taken to minimize the likelihood of wind uplift.

Any field panel or part of a field panel which becomes seriously damaged shall be replaced at the direction of the CQA Officer or CONTRACTOR. Minor damage, such as small wrinkles, crimps, etc., shall be repaired using approved procedures as described in the specifications. Damaged field panels which have been rejected for use shall be removed from the site.

4.6.2.1.1 Field Seaming of Geomembrane

Personnel

The Geomembrane Installer shall provide the CONTRACTOR and CQA Officer with a list of the Installer's proposed seaming personnel and their previous seaming experience. Seaming personnel shall be required to pass a seaming test prior to commencement of field seaming operations.

Field Seaming Methods and Equipment

General: Only seaming methods and equipment meeting the specifications shall be used for field seaming of the geomembrane panels.

Where conditions warrant, the Installer may be allowed to use a temporary support surface between the geomembrane and the subgrade to achieve proper support conditions during seaming operations. The use of such support methods shall be subject to the approval of the CQA Officer. The support shall not be left in place and shall be removed on completion of seaming.

Wherever possible, wrinkles or "fishmouths" shall be pulled out of the overlap area prior to seaming. Where this cannot be done, they shall be cut along the ridge of the wrinkle in order to

achieve a flat surface. Such cuts shall be seamed. Where the overlap is inadequate, an oval or round patch of the same geomembrane, extending a minimum of 6 inches beyond the cut in directions, shall be seamed onto the geomembrane.

Extrusion Welding Process: Extrusion welding apparatus shall be equipped with gauges to measure the temperature at the nozzle or the preheat temperature of the apparatus. The CQA Personnel shall monitor the extrudate and ambient temperature at appropriate intervals. The extruder shall be purged of heat-degraded extrudate at the beginning of each seaming sequence.

Artificially induced cooling of extrudate welds (using water or any other means) shall not be allowed. Sufficient time between welding and non-destructive testing shall be taken so that nondestructive testing procedures do not cause artificial cooling of the extrudate.

Fusion Welding Process: Fusion welding apparatus shall be automated, self-propelled devices which produce either a single seam or a double seam with an enclosed central air space. The apparatus shall be equipped with gauges which indicate the equipment temperatures during welding. For the seaming of cross-seams, the top and bottom edges of the cross-seam shall be ground to a smooth incline prior to seaming.

The CQA Personnel shall log ambient and seaming apparatus temperatures, as well as seaming apparatus speed for each seam.

Seam Overlap and Preparation: Prior to seaming, geomembrane rolls or panels shall be overlapped as specified in the Technical Specifications. Procedures used to temporarily bond adjacent rolls together shall not result in damage to the geomembrane. If mechanical devices such as hot air leisters are used for temporary bonding, the air temperature at the nozzle of such equipment shall be controlled so as not to damage the geomembrane. Solvents or adhesives shall not be used.

Seams shall be aligned to create as smooth a surface as practicable with a minimum of wrinkles and "fishmouths". The area in the immediate vicinity of the seam shall be free of moisture, dust, dirt, debris, or any other foreign material and, if necessary, sheltered from wind and dust immediately prior to and during the seaming operation. If grinding is required along the seam, this shall be done according to the Manufacturer's recommendations, within one hour of the seaming operation and in a way which does not damage the geomembrane. This process also shall include cleaning the seam area with a brush or forced air immediately prior to seaming. Particular care shall be paid to the condition of existing geomembrane prior to tie-in with new geomembrane.

The CQA Personnel shall document geomembrane seam overlaps and preparation procedures.

Weather Conditions

Seaming shall not be attempted in inclement weather as specified in the Technical Specifications.

Trial Seams

Trial seams shall be made and tested to verify that adequate conditions exist for field seaming to proceed. Each seamer shall produce a trial seam at the beginning of each shift. Additional trial seams shall be made and tested as specified in the Technical Specifications. This frequency may change at the discretion of the CQA Officer with approval of the CONTRACTOR. The CQA Personnel shall monitor and log the trial seam results.

4.6.2.1.2 Nondestructive Testing of Field Seams**General**

Seams shall be nondestructively tested by the Installer over their full length to verify their continuity. It should be noted that this testing does not provide any information regarding seam strength. Nondestructive testing shall be performed concurrently with field seaming using the equipment and procedures described below. Testing equipment and procedures other than those given below shall be subject to approval by the CONTRACTOR prior to their use. Any seam which fails the nondestructive test shall be repaired in accordance with approved procedures as described in the Specifications. Repairs shall be retested to determine the success of the repair.

Where CQA Personnel determine that seams cannot be nondestructively tested due to physical constraints, the seams shall be capped with the same geomembrane or double seamed. CQA Personnel shall observe the seaming and capping of such seams to assess their adequacy and determine whether additional action is required. Where such a seam is accessible for testing prior to final geomembrane deployment, testing shall be performed prior to deployment.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

Vacuum Testing

For extrusion and single wedge fusion welded seams, seams shall be evaluated using vacuum box testing as specified in the Technical Specifications. The vacuum box shall consist of a rigid housing with a transparent viewing window on top and a soft, flexible gasket attached to the bottom of the housing. A port hole and valve assembly along with a calibrated vacuum gauge shall be provided at one end of the housing. The vacuum gauge shall be calibrated prior to initial use on the project and recalibrated on at least an annual basis, at the end of the project, or at the discretion of the CQA Officer. The Installer shall supply vacuum gauge calibrations to the CQA Officer for review prior to the start of testing. A steel vacuum tank and pump assembly complete with the necessary pressure controls, pipe connections, pressure hoses, and fittings shall be provided. A soapy solution and a method of dispensing the solution are also required.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

Air Pressure Testing

This test method (ASTM D5820) shall apply only when the double hot wedge fusion seaming method is used to form the seam. The testing equipment shall consist of an air pump capable of generating and sustaining pressure of at least 40psi complete with a pressure gauge and the necessary pressure hose, fittings, and connections. An approved pressure feed device such as a

sharp hollow needle shall be provided to penetrate into the central air channel at one end of the seam. A second calibrated pressure gauge in 1psi increments capable of reading pressures up to 40 psi shall be provided to detect any pressure loss at the opposite end of the seam from the pressure feed device. The pressure gauges shall be calibrated prior to initial use on the project and recalibrated on at least an annual basis, at the projects end or at the discretion of the CQA Officer. The Installer shall supply pressure gauge calibrations to the CQA Officer for review prior to the start of testing. The test shall be performed as specified in the Technical Specifications.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

4.6.2.2 Destructive Testing of Field Seams. Destructive testing of field seams shall be performed at selected locations in order to verify that seams satisfy the strength requirements listed in the specifications. Sampling and testing shall be done concurrently with field seaming operations so that corrective action, if required, may be implemented as the work progresses. Samples shall be taken for testing so as to achieve a minimum average daily frequency as listed in Table 4-2. Sample locations shall be determined by CQA Personnel based on the required sampling frequency and seaming observations. The Installer shall not be informed in advance of the locations where the seam samples will be taken. Additional test locations may be required during seaming operations such as along tie-in seams with existing geomembranes. The necessity for such additional sampling and testing shall be determined by CQA Personnel, and extra testing shall be performed when there is cause to suspect the presence of excess crystallinity, contamination, offset welds, or any other potential defect. The CQA Officer may increase the minimum frequency of destructive testing as the work progresses based on the results of previous testing.

Samples shall be cut by the Installer under the observation of CQA Personnel. Samples may be cut prior to nondestructive seam testing. Each sample shall be numbered and identified. The sample number and location shall be recorded by CQA Personnel on the layout drawings.

The test sample shall measure approximately 12 inches wide by 42 inches long with the seam centered lengthwise. The sample shall be cut into three equal parts having a minimum length of 12 inches. One sample shall be taken by CQA Personnel for destructive testing under laboratory conditions. One sample shall be given to the Installer to perform CQC testing. The third sample shall be kept in storage by the CONTRACTOR.

The area from which the test sample was cut shall be immediately repaired in accordance with approved procedures described in the Specifications. Seams created for these repairs shall be nondestructively tested in accordance with Section 4.6.2.1.2.

Neither of the field tests shall fail in the seams. The results of the laboratory testing by CQA Personnel shall in any case determine the acceptability of the field seam. The tests shall be performed in accordance with the methods listed in Table 4-2.

Passing values for field testing are defined in specification 0600X-SP-C0077. Field testing shall meet these values for each test otherwise the seam will be considered failing.

A field seam shall only be considered acceptable when it is bounded by two destructive test locations which meet the seam strength requirements listed in the specifications, as well as passing the nondestructive tests described in Section 4.6.2.1.2. Whenever a sample fails a destructive test the Installer shall repair the failed seam as specified in the Technical Specifications.

The continuity of capped seams shall be verified by nondestructive testing in accordance with Section 4.6.2.1.2. In addition, if the total capped seam length exceeds 150 feet, a destructive sample shall be taken for laboratory testing as described above.

The CQA Personnel shall document actions taken in conjunction with destructive test failures.

4.6.2.3 Repairs. The entire geomembrane surface shall be examined by CQA Personnel in order to confirm that the geomembrane is free of any defects, holes, blisters, undispersed raw materials, or contamination by foreign matter. Particular attention shall be paid to existing geomembrane in tie-in areas. Whenever possible, the examination of the geomembrane surface shall be done prior to any seaming in that area. If necessary, the geomembrane surface shall be cleaned by the Installer so that it is free of dust, mud, or any other materials which may inhibit a thorough examination of the surface. Any suspect areas shall be clearly marked by CQA Personnel and nondestructively tested by the Installer in accordance with Section 4.6.2.1.2. Any location which fails to pass the nondestructive testing or from where a destructive test sample has been removed shall be repaired using one of the procedures described below.

Small tears, wrinkles, scratches, or pinholes shall be repaired by the Installer using spot welding, seaming, or patching, as appropriate. Large holes and tears, undispersed raw materials, and any areas which have been contaminated by foreign matter shall be repaired by the Installer as specified in the Technical Specifications.

Repairs shall be nondestructively tested using the appropriate methods described in Section 4.6.2.1.2. Unless additional destructive testing is required as described in Section 4.6.2.2, repairs which pass the nondestructive test shall be accepted as being adequate. Any repairs which fail the nondestructive test shall not be accepted, and the Installer shall perform the necessary remedial work and retest the repaired area until it passes the nondestructive testing criteria.

Upon completion of field seaming and testing, and prior to any placement of materials on top of the geomembrane, CQA Personnel shall identify any large wrinkles or "fishmouths" which may have been built into the geomembrane. Any such features shall be cut out, repaired, and tested by the Installer.

In any given area, no work shall proceed with any materials which may cover the geomembrane until repairs in that area have been successfully made. As the work progresses, CQA Personnel shall document locations requiring repair work and shall confirm that repairs have been successfully made.

Materials in Contact with Geomembrane. Equipment used for placing and compacting overlying soil materials shall not be driven directly on to any geosynthetic material. The minimum thickness of material maintained between the geomembrane and the equipment shall be as specified in the Technical Specifications. Equipment shall be observed by the CQA Personnel during placement to document that no leakage of hydrocarbons occurs, particularly on top of the geomembrane.

Placement of soil materials on top of the geomembrane shall not be allowed within 50 feet of any unseamed edge of geomembrane until field seaming of that edge is complete. This is required to allow sufficient room to work out any large wrinkles or "fishmouths" prior to seaming.

The placement of cover materials shall be done with caution and in a manner which is least likely to cause wrinkles in, or damage to, the geomembrane. The CQA Personnel shall monitor the placement of cover materials over the geomembrane on a regular basis.

4.6.3 Post-Construction

Site Clean-up

Upon completion of work in any given area, CQA Personnel shall examine that area to determine whether waste and extraneous materials have been removed and that the area has been left in a satisfactorily clean condition to allow placement of materials on top of the geomembrane.

Completion of Work

The installation of the geomembrane shall be considered as complete when: (1) required deployment, field seaming, testing, repairs, retesting, and site clean-up have been completed by the Installer and approved by CQA Personnel; (2) the Installer has submitted the required quality control certificates and work/inspection records to the CONTRACTOR; and (3) the CQA Subcontractor is satisfied that the geomembrane has been installed in accordance with the plans and specifications.

4.7 LEACHATE COLLECTION SYSTEM (LCS)

The requirements for the leachate collection system (LCS), leachate transmission system, and leachate storage tanks are described in the following sections of the Specifications (most current revisions):

<u>Section Title</u>	<u>New Section No.</u>
Geosynthetics	0600X-SP-C0077
Leachate Collection System	0600X-SP-C0078
Crest Pad Building	0600X-SP-C0080
Leachate Tank	0600X-SP-C0082
Pipe, Valves, and Specials	0600X-SP-M0032
Leachate Pumps	0600X-SP-M0033
Crest Pad Piping	0600X-SP-M0032
Crest Pad Valves	0600X-SP-M0032

Meters, General	0600X-SP-M0032
Electrical Distribution System, Underground	0600X-SP-E0025
Electrical Work, Interior	0600X-SP-E0025

The CQA Personnel shall perform the following activities:

4.7.1 Pre-Construction

CQA Personnel shall inspect leachate collection, transmission, and storage system materials, equipment, and components when they are delivered to the site to confirm that they conform to the design criteria and specifications. Receiving inspection shall be performed in compliance with the procedures specified in the CQAP and CQA Subcontractor's QAP. Non-conformances shall be documented and submitted to the CONTRACTOR for disposition and resolution. In general, activities performed by CQA Personnel shall include the following:

- Inspect materials upon arrival at the site to confirm conformance to the specifications;
- Inspect piping components to confirm (from appearance and shipping documents) that they are constructed of materials as listed in the plans, specifications, and procurement documents and that they are not damaged. Take measurements to confirm that pipe is of specified size and wall thickness and that perforations are sized and spaced as specified;
- Observe and test to confirm that sand and gravel materials conform to the specifications, are of the proper size and gradation, and do not contain unacceptable types of materials. Testing requirements for the drainage layers are outlined in Section 4.3;
- Inspect to confirm that prefabricated structures (tanks, manholes, etc.) are as specified in the design. Such items include, but are not limited to, non-HDPE piping systems, prefabricated HDPE components, electrical equipment, and monitoring equipment. Inspection shall include visual observation of any corrosion-resistant coatings to document that they are present and without flaw. The CONTRACTOR shall be informed of the acceptance status of all such items prior to installation; and
- Witness, inspect and document LCS equipment, system components, and mechanical/electrical equipment to confirm they meet specification requirements. Acceptance Tests (AT) shall be performed by the Construction SUBCONTRACTOR and observed by CQA Personnel.

4.7.2 Construction

4.7.2.1 Pipe Network Installation. The HDPE pipe network shall be placed according to Technical Specifications and Drawings. CQA monitoring activities shall include:

- Review of construction subcontractor's submittals concerning joining methods and type of perforations;

- Review of manufacturer's certification to document that the HDPE pipe meets the specifications;
- Visually observe that the geonet and geotextile layers are placed over the geomembrane prior to pipe installation;
- Observe and measure to confirm that the pipes are placed at specified locations and in specified configurations, and that pipe grades are as specified;
- Verify that the internal cleanliness of HDPE pipe is maintained;
- Visually observe that pipes are joined together and perforated in accordance with the approved procedures. Visual inspection of the carrier pipe is not required when double containment pipe is joined using the double butt fusion process (the pipes will be pressure tested);
- Observe that the placement of any filter or backfill materials around the pipe proceeds as shown on the plans;
- Witness, review, and document testing of HDPE piping prior to being buried or covered with liner; and
- Observe that backfilling and compaction are completed as specified and that, in the process, the pipe network is not damaged.

4.7.2.2 Drainage Layer. Inspection of the drainage layer shall include:

- Testing the material to confirm that it has the specified particle size and is free from excessive amounts of fines or organic materials (See Section 4.3);
- Measuring the thickness and observing coverage of each drainage layer as it is placed in the LCS (coordinate with CQA Surveyor); and
- Surveying the completed layer to document that specified slopes and grades are obtained (coordinate with CQA Surveyor).
- Placement of the drainage layers shall not damage any component of the underlying composite liner or the piping.

4.7.2.3 Geosynthetics

Manufacture

The geosynthetics manufacturers shall provide a list of guaranteed properties for the type of geosynthetics to be delivered. The manufacturers shall also provide written certification signed by a responsible party that the materials actually delivered have properties which meet or exceed the guaranteed values.

Rolls of geosynthetics shall be marked or tagged with the following information:

- manufacturer's name,
- product identification,
- lot number,
- roll number, and
- roll dimensions.

If any special handling of the materials is required, it shall be so marked, e.g., "This Side Up" or "This Side Against Geonet".

Shipment, Handling, and Storage

The geotextile and geocomposite material shall be protected from ultraviolet light exposure, precipitation or inundation by water, mud, dirt, dust, puncture, cutting, and any other damaging or deleterious conditions as specified in the Technical Specifications. CQA Personnel shall document that geonets are free of dirt and dust just before installation. If the geonets are judged dirty or dusty, they shall be washed by the Installer prior to installation.

Conformance Testing

Geosynthetics samples shall be obtained and tested in accordance with the phase, test methods, and frequencies listed in Table 4-2. CQA Personnel shall remove samples and forward them to an approved geosynthetic laboratory for testing to document conformance to both the design specifications and the list of guaranteed properties. Samples shall be taken across the entire width of the roll and shall not include the first 0.9 meter (three feet). Unless otherwise specified, samples shall be 0.9 meter (three feet) long by the roll width. The machine direction shall be marked on the samples with an arrow.

CQA Personnel shall examine all results from laboratory conformance testing and shall report any nonconformance to the CQA Officer and the CONTRACTOR.

Installation

The geosynthetics Installer shall handle geosynthetics in such a manner that they are not damaged. On slopes, the geocomposite material shall be securely anchored in the anchor trench and then rolled down the slope in such a manner as to continually keep the geocomposite sheet in tension. In the presence of wind, geotextiles, geocomposites, and geonets shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during placement and shall remain until replaced with earth cover material. Geotextiles, geonets, and geocomposites shall be cut using approved cutters only. Special care shall be taken to protect other materials from damage which could be caused by the cutting of the geotextile, geocomposite, and geonet materials. The Installer shall take any necessary precautions to prevent damage to underlying layers during

placement of the geotextile, geocomposites, or the geonet. During placement of geotextile and geocomposite materials, care shall be taken not to entrap stones, sandbags, excessive dust, or moisture that could damage the geosynthetic material, clog drains or filters, or that might hamper subsequent seaming. Geotextiles and geocomposites shall not be dragged across textured geomembranes.

CQA Personnel shall visually examine the entire surface of the geotextile and geocomposite layers after installation to confirm that no potentially harmful foreign objects, such as needles, are present. In addition, the CQA Personnel may undertake a sweep of the entire geotextile surface using a metal detector, to determine the presence of any such items.

During placement of geonets, care shall be taken not to entrap dirt or excessive dust that could cause clogging of the drainage system, and stones that could damage the adjacent geomembrane. If dirt or excessive dust is entrapped in the geonet, it shall be hosed clean prior to placement of the next material on top of it. In this regard, care should be taken with the handling of sandbags, to prevent rupture or damage. Care shall be taken not to leave tools in the geonet. CQA personnel shall confirm that all geonet is covered with geotextile on the same day it is deployed.

Seams

Geosynthetics shall be seamed as specified in the Technical Specifications.

CQA Personnel shall visually examine geosynthetics seams to document that the specified requirements have been met.

Repair

Holes or tears in the geosyntheticse shall be repaired as specified in the Technical Specifications.

CQA Personnel shall visually observe and document geosynthetics repair procedures.

Soil Placement

Soil shall not be placed in direct contact with geonets.

The Installer shall place soil materials on top of geotextiles or geocomposites in such a manner that there is:

- no damage to the geotextile, geocomposite, or underlying layers;
- minimal slippage of the geotextile or geocomposite on the underlying layers; and
- no excess tensile stresses in the geotextile or geocomposite.

CQA Personnel shall visually observe that the above conditions are satisfied.

4.7.2.4 Leachate Collection, Transmission, and Storage System Equipment and Components

Electrical System and Pump Controls

The electrical system which controls the leachate pumps shall be checked for proper installation and operation. The SUBCONTRACTOR's CQC activities are described in the pertinent sections of the specifications. CQA Personnel shall perform the following activities:

- Receipt inspections of electrical components (verify UL, listings, etc.);
- Review construction subcontractor's submittals and proposed equipment to document compliance with the specifications;
- Verify and document final tagging, labeling, and marking of the electrical systems (i.e. breaker, outlets, disconnects, switches, etc.); and
- Perform or review component checks of resistance, grounding, and load prior to complete system check.

Pumps, Piping, Meters, and Valves

The pumps, piping, instruments (such as the flow meters), and valves that are included in the leachate collection (removal and transfer) system shall be examined and tested at the system level for conformance to the specifications and proper performance. CQA Personnel shall perform the following activities in conjunction with these items:

- Review construction subcontractor's submittals and equipment deliveries to the site to verify conformance with the specifications;
- Review the results of subcontractor's acceptance testing of the piping system;
- Verify and document final tagging, labeling, and marking of the electrical systems (i.e. breaker, outlets, disconnects, switches, etc.);
- Review system performance checks to confirm operation in accordance with the specifications; and
- Review the complete leachate removal system performance using the installed pumps as described in the specifications.

Leachate Storage Tank System

The leachate storage tank, cover, piping, instruments (such as the level measurement), and valves shall be examined and tested at the system level for conformance to the specifications and proper performance. CQA Personnel shall perform the following activities in conjunction with these items:

- Review construction subcontractor's submittals and equipment deliveries to the site to verify conformance with the specifications;
- Oversight of subgrade and foundation preparation; placement and compaction of backfill; placement of reinforcing steel and anchor bolts; concrete placement; placement of shop-fabricated tank parts; erection of field-erection tank parts; installation of piping, pumping, and other ancillary equipment to verify conformance with the specifications;
- Oversight of installation and testing of tank liner systems to verify conformance with the specifications;
- Review the results of subcontractor's acceptance testing of the system;
- Verify and document final tagging, labeling, and marking of the systems (i.e. breaker, outlets, disconnects, switches, etc.);
- Review system performance checks to confirm operation in accordance with the specifications; and
- Review the complete leachate removal system performance using the installed pumps as described in the specifications.

Acceptance Test Plan

CQA Personnel will observe and record the results of the Acceptance Tests. The acceptance tests will be performed by the SUBCONTRACTOR to demonstrate that the installed pumps, piping, leachate storage tank, instrumentation, and electrical system components function as intended by the design.

4.7.3 Post-Construction

The post-construction inspection of the LCS shall include observations to confirm that systems and components have been installed in the proper locations and according to the design drawings, Construction Specifications, and Manufacturer's specifications.

5.0 DOCUMENTATION

This section describes the documentation required during construction of ERDF Cells 9 & 10.

5.1 DAILY REPORTS

Daily reports shall be completed by CQA Personnel when they are on site. CQA Personnel shall be assigned field books which will be labeled with a unique number issued by the CQA Officer. The field CQA Personnel shall record field observations and the results of field tests either in their assigned field book or on standard field data sheets. After each book is filled and at the end

of the project, the field books shall be returned to the CQA Officer or CQA Engineer and routed to the project files. CQA Officer or CQA Engineer shall keep a log of field logbooks issued, returned, and completed. Log books shall be completed and maintained in accordance with CONTRACTOR's expectations.

Each page of the field book shall be numbered, dated, and initialed by CQA Personnel. At the start of a new work shift, CQA Personnel shall list the following information at the top of the page:

- Job Name
- Job Number
- Date
- Name
- Weather conditions
- Page number (if pages are not pre-numbered)

The remaining individual entries shall be prefaced by an indication of the time at which they occurred. If the results of test data are being recorded on separate sheets, it shall be noted in the field book.

Entries in the field book shall include but not be limited to the following information:

- Reports on any meetings held and their results;
- Equipment and personnel being used in each location, including subcontractors;
- Descriptions of areas being observed, inspected, and documented;
- Description of materials delivered to the site, including any quality verification (vendor certification) documentation;
- Descriptions of materials incorporated into construction;
- Calibrations, or recalibrations, of test equipment, including actions taken as a result of recalibration;
- Decisions made regarding use of material and/or corrective actions to be taken in instances of substandard quality; and

- Unique identifying sheet numbers of inspection data sheets and/or problem reporting and corrective measures reports used to substantiate the decisions described in the preceding item.

The daily report shall include information of the day's work activities, tests and observations that were made, descriptions of the adequacy of the work performed, and highlight any unresolved issues that must be addressed by the CQA Officer or CQA Personnel the following day. In addition, the daily report shall reference the field book number and page numbers that cover that day's activities. The daily reports shall be submitted to the CONTRACTOR.

The CQA Engineer shall review and initial each daily report before distributing to the project quality records and the CONTRACTOR.

5.2 INSPECTION DATA SHEETS

Observations, results of field and laboratory tests performed on site or off site shall be recorded on an inspection data sheet. At a minimum, each inspection data sheet shall include the following information:

- Unique identifying sheet number for cross-referencing and document control;
- Description of the inspection activity;
- Location of the inspection activity and location from which the sample was obtained;
- Type of inspection activity and/or procedure used (reference to standard method when appropriate);
- Recorded observation or test data, together with necessary calculations;
- Results of the inspection activity (e.g. pass/fail) and comparison with specification requirements;
- Identification of personnel involved in the inspection activity; and
- Signature of the CQA Personnel performing the activity and concurrence by the CQA Officer or CQA Engineer.

5.3 NONCONFORMANCE REPORTING

A nonconformance is considered to be a deficiency in characteristics, documentation, or procedures that renders the quality of an item or activity unacceptable or indeterminate. If a deficiency cannot be repaired or replaced to the satisfaction of CQA Personnel within the guidelines established by this CQAP, then such a deficiency shall be considered a nonconformance and shall be documented in accordance with the CQA Subcontractor's NCR procedure. Nonconforming situations shall be brought to the attention of the CQA Officer and

the CONTRACTOR for concurrence prior to initiation of the NCR. These individuals and others as directed by the CONTRACTOR shall participate in NCR disposition, resolution, and corrective action processes. Documentation relating to NCR situations shall be retained in the project quality.

5.4 DESIGN CHANGES AND CLARIFICATIONS

Requests for changes to the specifications or drawings shall be completed on form(s) provided by the CONTRACTOR. Design changes shall be approved by the CONTRACTOR prior to implementation.

Requests for modifications to the CQAP shall be made by memorandum to the CONTRACTOR with copies to the CQA Officer.

Construction questions or clarifications regarding interpretation of the plans and/or specifications shall be submitted to the CONTRACTOR on forms provided by the CONTRACTOR.

5.5 PROGRESS REPORTS

The CQA Officer shall prepare a summary progress report each week, or at time intervals established at the pre-construction meeting. As a minimum, this report shall include the following information:

- A unique identifying sheet number for cross-referencing and document control;
- The date, project name, location, and other information;
- A summary of work activities accomplished during progress reporting period;
- Identification of areas or items inspected and/or tested during the reporting period that are addressed by the report;
- A summary of the quality characteristics being evaluated, with appropriate cross-references to specifications and/or drawings;
- A summary of inspection and test results, failures, and retests;
- A summary of construction situations, deficiencies, and/or defects occurring during progress reporting period;
- A summary of other problem resolutions and dispositions; and
- The signature of the CQA Officer.

5.6 FINAL DOCUMENTATION

Daily inspection summary reports, field logbooks, inspection sheets, data sheets, problem identification and corrective measures reports, acceptance reports, deviations from design and material specifications (with justifying documentation), DCNs, photographic records, progress reports, drawings, drawing revisions, and other documentation shall be retained as permanent project quality records in compliance with the CQA Subcontractor's QAP. At the completion of the project, a final summary report that incorporates the above information, along with as-built drawings, shall be prepared by the CQA Officer and submitted to the CONTRACTOR. The as-built drawings, which will be generated by a licensed land surveyor licensed in the State of Washington and retained by the SUBCONTRACTOR, shall include scale drawings depicting depths, plan dimensions, elevations, and fill thicknesses. The report shall include documentation of each construction component monitored by CQA Personnel and shall certify that the facility was constructed in accordance with the CQAP, Technical Specifications, and Drawings. The report shall be sealed by a professional engineer registered in the State of Washington.

5.7 STORAGE OF RECORDS

During the construction of ERDF cells, the CQA Officer shall be responsible for CQA documents. This includes the CQA Officer's copy of the design criteria, plans, procedures, and specifications; the CQAP; and the originals of the data sheets and reports. Completed documents shall be routed to the project quality records in compliance with those sections of the CQA Subcontractor's QAP which address project QA records management, including maintenance of a records index, access control, and duplicate records requirements. Working copies shall be retained at the field office to the extent necessary to properly support ongoing activities. Records shall be submitted to the CONTRACTOR in accordance with Exhibit I.

6.0 REFERENCES

ASTM, 2009, *2009 Annual Book of ASTM Standards*, American Society for Testing and Materials, Philadelphia, Pennsylvania

Volume 4.08: Soil and Rock:

- Cl36 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- D422 Standard Test Method for Particle-Size Analysis of Soils
- D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³)
- D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
- D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique

- D1556 Standard Test Method for Density & Unit Weight of Soil in Place by the Sand-Cone Method
- D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-mm³)
- D1603 Standard Test Method for Carbon Black Content in Olefin Plastics
- D1777 Standard Test Method for Thickness of Textile Materials
- D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
- D2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- D2434 Test Method for Permeability of Granular Soils (Constant Head)
- D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D2937 Standard Test Method for Density of Soil in Place by the Drive Cylinder Method
- D4218 Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
- D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- D4643 Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Heating
- D4716 Standard Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
- D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
- D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

- D5084 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
- D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
- D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles
- D5321 Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
- D5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
- D5641 Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
- D5820 Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
- D5994 Standard Test Method for Measuring Core Thickness of Textured Geomembrane
- D6391 Standard Test Method for Field Measurement of Hydraulic Conductivity Limits of Porous Materials Using Two Stages of Infiltration from a Borehole
- D6392 Standard Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Method
- D6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
- D6938 Standard Test Method for In-Place Density and Water Content of Soil-Aggregate by Nuclear Methods (Shallow Depth)
- D7005 Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
- D7466 Standard Test Method for Measuring the Asperity Height of Textured Geomembrane
- Ecology, 1994, *Dangerous Waste Regulations*, WAC 173-303, Washington State Department of Ecology, Olympia, Washington
- EPA/600/R-93/182 Quality Assurance and Quality Control for Waste Containment Facilities, 2nd Edition, Waste Containment Facilities, ASCE Press, 2007
- EPA, 1994, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, 40 CFR 264, U.S. Environmental Protection Agency, Washington, D.C.

WCH-51, *River Corridor Closure Contract Quality Assurance Program Description*,
Washington Closure Hanford, LLC, Richland, Washington

TABLES

**TABLE 4-1. SOIL MINIMUM TESTING REQUIREMENTS
4-1.1 EARTHWORK**

Phase	Material	Test and ASTM Number	Frequency
Pre-construction	Backfill	Grain Size Distribution (C136/D422) ⁽¹⁾	1 per 8,000 yd ³
		Atterberg Limits (D4318)	1 per 8,000 yd ³ for soil with > 12% passing the No. 200 sieve
		Modified Proctor Compaction (D1557)	1 per 8,000 yd ³
Construction	Waste Trench Subgrade ⁽²⁾	In-Place Density (D6938)	1 per 10,000 ft ²
	Structural Fill & Waste Trench Embankment ⁽²⁾	In-Place Density (D6938)	1 per 10,000 ft ² per lift
	Below Crest Pad Bldgs ⁽²⁾	In-Place Density (D6938)	2 per lift
	Utility Trench	In-Place Density (D6938)	1 per 300 ft of trench

Notes:

- (1) ASTM C136 shall be used when the amount of material passing the No. 200 sieve is less than 12% by weight. ASTM D422 shall be used when the fine soil fraction is greater than this value
- (2) If ASTM D6938 is used at least one ASTM D1556, ASTM D2937, or ASTM D2167, as well as one ASTM D2216 or ASTM D4643 shall be performed per shift.

4-1.2 ADMIX SOIL LINER

Phase	Material	Test and ASTM Number	Frequency
Pre-construction	Bentonite	Manufacturer's Certificates	1 per 500 tons delivered
	Admix	Recompacted Hydraulic Conductivity (D5084)	1 per 20,000 yd ³
		Standard Proctor (D698)	1 per 20,000 yd ³
		Atterberg Limits (D4318)	1 per 5,000 yd ³
		Natural Moisture Content (D2216)	1 per 1,000 yd ³
		Maximum Clod Size	Periodic Visual Monitoring
	Base Soil	Belt Scale Measurements	1 per 5,000 yd ³
		Particle Size Distribution/Hydrometer (D422)	1 per 10,000 yd ³
Test Fill	Admix	USCS Classification (D2487)	1 per 10,000 yd ³
		Visual Observation	Continuous
		In-Place Moisture-Density (Nuclear, D6938)	6 per lift
		In-Place Moisture-Density (Rubber Balloon, D2167), (Drive Cylinder, D2937) or (Sand Cone, D1556)	1 per lift
		Moisture Content (D2216 or D4643)	1 per day if nuclear gauge is used
		Hydraulic Conductivity (D5084)	1 per lift
		Boutwell (ASTM D6391)	1 per test fill
Construction	Admix	Visual Observations	Continuous
		In-Place Moisture-Density (Nuclear, D6938)	5/acre/lift
		In-Place Moisture-Density (Rubber Balloon, D2167), (Drive Cylinder, D2937) or (Sand Cone, D1556)	1 per day, if nuclear gage is used.
		Shelby Tube for Permeability (D5084)	1 per 5,000 yd ³ , and at least 1 in a corner area
		Moisture Content (D2216 or D4643)	1 per day if nuclear gauge is used

4-1.3. GRAVEL DRAINAGE LAYERS

Phase	Material	Test and ASTM Number	Frequency
Construction	Gravel	Visual Observations	Continuous
		Standard Proctor (ASTM D698) ⁽¹⁾	1 per 10,000 yd ³
		Grain Size Distribution (C136)	1 per 2,000 yd ³
		Permeability (D2434)	1 per 2,000 yd ³
		In-Place Density (ASTM D6938) ⁽¹⁾	1 per 10,000 yd ³

(1) Type C material only.

4-1.4 OPERATIONS LAYER

Phase	Material	Test and ASTM Number	Frequency
Construction		Visual Observations	Continuous
		Standard Proctor (ASTM D698)	1 per 10,000 yd ³
		Grain Size Distribution (D422)	1 per 2,000 yd ³
		In-Place Density (D6938)	1 per 20,000 ft ²

4-1.5 ANCHOR TRENCH/SIDE SLOPE RISER PIPE TRENCH

Phase	Material	Test and ASTM Number	Frequency
Construction	Backfill	Visual Observations	Periodic
		In-Place Density (D6938)	1 per 300 ft of trench
		Grain Size Distribution (D422)	1 per 2,000 yd ³

TABLE 4-2. GEOSYNTHETIC MATERIALS MINIMUM TESTING REQUIREMENTS
4-2.1. HDPE GEOMEMBRANE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Resin	Manufacturer's Documentation Certification and QC Test Results	Every Lot
	Geomembrane	Manufacturing Plant Visit	During Production
		Manufacturer's Documentation, Certification and QC Test Results	Every Roll
Pre-Construction (Before Installing) (Note 1)	Geomembrane	Receiving Inspection	Every Roll
		Specific Gravity (D1505) Carbon Black Content (D1603 or D4218) Asperity Height (D7466) Tear (ASTM D1004) Carbon Black Dispersion (D5596) Thickness (D5199 or D5994) Yield Strength (D6693) Elongation at Yield (D6693) Break Strength (D6693) Elongation at Break (D6693) Puncture Resistance (D4833)	Every 50,000 ft ² per Lot
		Friction Angle (Direct Shear – D5321) admix vs geomembrane	2 Tests Total
		Extrudate	Documentation and Certification
	Installation Surface	Installer's Certification of a Suitable Installation Surface	Each Installation Surface
Construction	Geomembrane	Seam Overlap	Every Panel
		Trial Seams	2 times/day per Welder per Machine
		Vacuum Test (D5641)	All Extrusion or Single Wedge Fusion Welds
		Air Pressure Test (D5820)	All Double Wedge Fusion Welds
		Seam Destructive Test (D6392) (5 peel/5 shear)	Min. Avg. of 1 per 500 ft per Welder

Notes:

1. Testing may be performed prior to shipment from factory.

4-2.2 GEOTEXTILE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geotextile and Thread	Manufacturer's Documentation, Certification, and QC Test Results	Every 50,000 ft ² per Lot
Pre-Construction (Before Installing) (Note 1)	Geotextile	Receiving Inspection	Every Roll
		Mass per Unit Area (D5261) Grab Strength (D4632) Tear Strength (D4533) Puncture Strength (D4833) Thickness (D1777 or D5199) Filter Application Only Permittivity (D4491), Type A only Apparent Opening Size – AOS (D4751), Type A only	Every 50,000 ft ² per Lot

Notes:

1. Testing may be performed prior to shipment from factory

4-2.3. GEOCOMPOSITE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (After Bonding, but Before Shipping)	Geonet and Geotextile Components	Manufacturer's Documentation, Certification and QC Tests	Every 50,000 ft ² per Lot
		Passing Conformance Test Results for both the Geonet and the Geotextile	
Pre-Construction (Note 1)	Geocomposite	Manufacturer's Documentation, Certification and QC Test Results	Every 50,000 ft ² per Lot
		Receiving Inspection	
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Textured HDPE Liner	
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Operations Layer	
		Ply Adhesion (ASTM D7005)	
		Transmissivity (ASTM 4716)	

Notes:

1. Testing may be performed prior to shipment from factory

4-2.4 GEONET

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geonet	Manufacturer's Documentation Certification and QC Tests	Every 50,000 ft ² per Lot
Pre-Construction (Before Installing) (Note 1)	Geonet	Receiving Inspection	Every Roll
		Polymer Specific Gravity (D1505) Thickness (D1777 or D5199) Mass per Unit Area (D5261)	Every 50,000 ft ² per Lot
Notes:			
1. Testing may be performed prior to shipment from factory.			

TABLE 4-3. ERDF CONSTRUCTION HOLD POINTS

Phase	Activity	Hold Point	Needed to Proceed
Excavation	Subgrade for Liner	Before Covering Subject Portion with Next Layer	Passing CQA density tests
			CQA subgrade survey completed
Soil Liner	Admix Placement	Before Placing in Cell	Passing CQA tests for test fill and stockpiled admix
	Final Surface	Before Covering with HDPE Liner	Passing CQA tests and observation requirements
CQA surveys to verify final soil liner thickness			
HDPE Liner	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
			Acceptable SUBCONTRACTOR and CQA Friction Angle tests
		Before Covering Subject Portion with Next Layer	CQA review of SUBCONTRACTOR's installation records
			Passing CQA tests
	CQA visual inspection of panels, seams, penetrations, and repairs		
CQA surveys of seams, penetrations, and repairs			
Geotextile	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
		Before covering subject Portion with Next Layer	CQA visual inspection of panels, seams, penetrations, and repairs
Geocomposite	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
		Before Covering Subject Portion with Next Layer	Acceptable SUBCONTRACTOR and CQA Friction Angle tests
Drainage Gravel	Installation	Before Covering subject Portion with Next Layer	Passing CQA tests
			CQA surveys to verify layer thickness
Operations Layer	Installation	After Installing	Passing CQA tests
			CQA surveys to verify layer thickness
Piping	Installation	Before Backfilling Trenches	Passing CQA Receipt Inspections
			Passing Pressure and Leak Test Results

Requisition No: R013213A00

EXHIBIT "D" SCOPE OF WORK FOR

CONSTRUCTION QUALITY ASSURANCE (CQA)
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)
CELLS 9 & 10 CONSTRUCTION

Rev	Date	Reason for Revision	Originator	Checker	Project Engineer/DES
0	1/26/10	Issued for Award	WAB	CKB	BES
Washington Closure Hanford LLC		RIVER CORRIDOR CLOSURE CONTRACT	Job No: 14655		
			Scope of Work No. 0600X-SW-S0013		
			Page 1 of 1677 mje 01/26/10		

DOCUMENT CONTROL *mje 01/26/10*

EXHIBIT "D"
SCOPE OF WORK FOR:

CONSTRUCTION QUALITY ASSURANCE (CQA)
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)
CELLS 9 & 10 CONSTRUCTION

REV NO: 0

WASHINGTON CLOSURE HANFORD, LLC
River Corridor Closure Project

TABLE OF CONTENTS

1.0 INTRODUCTION	5
1.1 ABBREVIATIONS	5
1.2 ROLES AND RESPONSIBILITIES	6
2.0 DESCRIPTION OF WORK	7
2.1 WORK INCLUDED	7
2.1.1 Mobilization Activities	7
2.1.2 Inspection Activities	7
2.1.3 Test Fill Testing Activities	8
2.1.4 Acceptance Testing	8
2.1.5 Documentation	8
2.1.6 CQA SUBCONTRACTOR Submittals	9
2.1.7 Receiving Inspections	9
2.1.8 Review Construction Subcontractor’s Submittals	9
2.1.9 As-Built Drawings and Specifications	10
2.1.10 Meetings	11
2.2 WORK EXCLUDED	11
2.3 CONTRACTOR/GOVERNMENT FURNISHED EQUIPMENT/SERVICES	12
2.4 RELATED WORK	12
2.4.1 Integrated Work Control (IWC)	12
2.4.2 Integrated Safety Management System (ISMS)	12
2.4.3 Conduct of Operations (CONOPS)	12
2.4.4 Testing Laboratory Qualifications	12
2.5 WORK LOCATION	13
2.6 WORK SCHEDULE AND MILESTONES	13
2.7 SUMMARY OF DELIVERABLES	13
3.0 FUNCTIONAL REQUIREMENTS	13
3.1 CODES, STANDARDS, AND REGULATIONS	13
3.2 ENGINEERING	13
3.3 CONSTRUCTION	13
3.4 PROCUREMENT	13
3.5 QUALITY ASSURANCE	13
3.6 HEALTH AND SAFETY	14
3.6.1 Nuclear Densometer	14

3.7 TECHNICAL CAPABILITY AND QUALIFICATIONS..... 15
3.8 TRAINING..... 15
3.9 ENVIRONMENTAL 15
4.0 REFERENCE DOCUMENTS..... 16
5.0 OTHER REQUIREMENTS 16

ATTACHMENTS

- ATTACHMENT A CONSTRUCTION QUALITY ASSURANCE PLAN FOR ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) CELLS 9 & 10
- ATTACHMENT B SUPPLIER QA PROGRAM RERQUIREMENTS
- ATTACHMENT C CONSTRUCTION SUBCONTRACT SUBMITTALS

1.0 INTRODUCTION

Washington Closure Hanford (WCH), the CONTRACTOR, manages the River Corridor Closure Project at the U.S. Department of Energy's Hanford Site in southeastern Washington State. WCH is responsible for safely constructing two new cells (Cells 9 and 10) at the Environmental Restoration Disposal Facility (ERDF). The Environmental Restoration Disposal Facility (ERDF) is designed to be an engineered disposal facility for low-level and mixed waste produced during environmental remediation of Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) past-practice units at the Hanford Site. Each cell is approximately 17 acres in size and includes primary and secondary liner and leachate collection systems.

The cell construction work requires independent third party verification that the cells and associated facilities have been constructed in accordance with the Construction Subcontract drawings and specifications. The verification activities are specified in the *Construction Quality Assurance Plan (CQAP) for Environmental Restoration Disposal Facility (ERDF) Cells 9 & 10*.

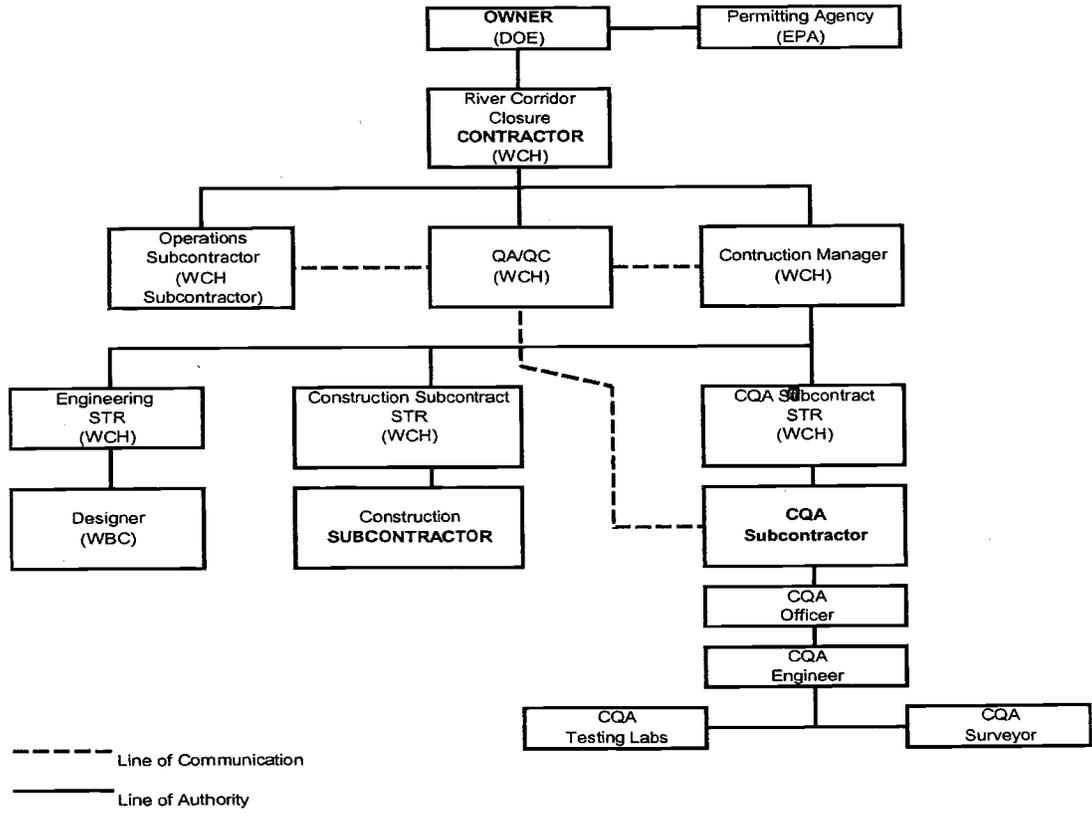
The Construction Quality Assurance Subcontractor (CQA SUBCONTRACTOR) is the independent third party and will perform the CQAP verification activities.

1.1 ABBREVIATIONS

ASTM	American Society for Testing and Materials
ATP	Acceptance Test Plan
CFR	Code of Federal Regulations
CQA	Construction Quality Assurance
CQAP	Construction Quality Assurance Plan
DOE	U. S. Department of Energy (OWNER)
ERDF	Environmental Restoration Disposal Facility
HDPE	High Density Polyethylene
HGET	Hanford General Employee Training
IWCP	Integrated Work Control Program
ISMS	Integrated Safety Management System
LCS	Leachate Collection System
O&M	Operation and Maintenance
SSRS	Subcontractor/Supplier Submittal Requirements Summary
STR	Subcontract Technical Representative
WAC	Washington Administrative Code
WCH	Washington Closure Hanford, LLC (CONTRACTOR)

1.2 ROLES AND RESPONSIBILITIES

The organization of the project has been developed for the CQA SUBCONTRACTOR to work independently from the Construction Subcontractor, except in the event of a nonconformance. The responsibilities and authority of project personnel are described in the CQAP. The roles and responsibilities of the project team are shown on the following figure.



2.0 DESCRIPTION OF WORK

The CQA SUBCONTRACTOR's work under this subcontract includes furnishing labor, technical and professional services, supervision, materials, supplies, equipment, and facilities necessary to perform of CQA verification activities specified for construction of ERDF Cells 9 & 10. The verification activities are specified in the *Construction Quality Assurance Plan (CQAP) for Environmental Restoration Disposal Facility (ERDF) Cells 9 & 10*. The CQAP is a WCH controlled document (0600X-QA-G0005). A copy of the CQAP is in Attachment A.

The construction of Cells 9 & 10 will be performed by the Construction Subcontractor under a separate Construction Subcontract. The Construction Subcontractor will also perform the construction quality control (CQC) activities specified in Specification No. 0600X-SP-G0048, Quality Control Requirements. The CQA SUBCONTRACTOR's testing will not be allowed in lieu of the Construction Subcontractor's construction quality control testing, unless approved by the CONTRACTOR.

Copies of the Construction Subcontract Technical Specifications, Drawings, and schedule are provided in Exhibits "E", "F", and "B" for the CQA SUBCONTRACTOR's use to ensure adequate resources are available to perform the CQA work.

After construction of the cells is complete, the CQA SUBCONTRACTOR shall certify (professional engineer registered in the State of Washington) that Cells 9 & 10 and associated facilities have been constructed in accordance with the Construction Subcontract drawings and specifications.

2.1 WORK INCLUDED

2.1.1 Mobilization Activities

Mobilization activities include, but are not limited to, training, certification, and qualification of personnel, procurement and mobilization of construction testing equipment, supplies, and consumables, development, review, and approval of submittals, and delivery and setup of construction testing equipment, establishing testing laboratories/contracts and other necessary documentation, materials, and supplies to construction site.

2.1.2 Inspection Activities

The inspection activities are specified in the CQAP. A copy of the CQAP is in Attachment A to this exhibit. The following systems shall also be included in the Leachate Collection System inspections to verify construction and testing was performed in accordance with the Construction Subcontract specifications and drawings:

- The leachate transmission pipeline system, leachate storage tank system, and associated appurtenances.
- Electrical conduit and concrete encased duct banks.
- Crest Pad Building concrete and rebar.
- Crest Pad Building floor coatings.
- Crest Pad Building electrical testing.

2.1.3 Test Fill Testing Activities

The CQA SUBCONTRACTOR shall observe construction and perform testing of the subgrade and admix for the admix layer test fill in accordance with the requirements in the CQAP. The CQA SUBCONTRACTOR shall furnish, install, operate, maintain, and monitor the installation of the Two-Stage Borehole Test (ASTM D6391-06) in the admix test pad in accordance with the requirements specified in the CQAP. The CQA SUBCONTRACTOR shall be responsible for assuring the integrity of the geotechnical testing is not compromised due to weather. Archive samples shall be collected and provided to the CONTRACTOR. A Test Fill Report shall be prepared and submitted to the CONTRACTOR.

2.1.4 Acceptance Testing

The CQA SUBCONTRACTOR shall observe and record the results of the acceptance tests performed by the Construction Subcontractor as specified in CQAP. The CQA SUBCONTRACTOR shall also observe and record the results of the verification (i.e. dry run) acceptance tests prior to the performing the final acceptance testing.

The Construction Subcontractor will perform acceptance testing in accordance with the Exhibit "E" Technical Specifications.

2.1.5 Documentation

The documentation requirements are specified in the CQAP. A copy of the CQAP is in Attachment A to this exhibit.

A final certification report shall be prepared to document each construction component monitored by the CQA SUBCONTRACTOR as required in the CQAP. The certification report shall be signed by a professional engineer registered in the State of Washington. The final report shall also contain, in appendix format, the supporting data for the construction components monitored by CQA SUBCONTRACTOR.

To expedite review of the final certification report, portions of the final report (i.e. admix test fill, admix liner, secondary geomembrane liner, secondary leachate collection system, primary geomembrane liner, primary leachate collection system, leachate tank, etc.) and supporting data shall be submitted to the CONTRACTOR within 30 days after construction is completed on the component/system. The preliminary reports will be used to facilitate review of parts of the report prior to the completion of the entire project.

2.1.6 CQA SUBCONTRACTOR Submittals

CQA SUBCONTRACTOR shall submit submittals listed in Exhibit "I" and the subcontract documents in accordance with the requirements specified in Exhibit "I". Documentation submitted will be reviewed by the CONTRACTOR for accuracy and completeness. Submittals that do not meet the specific requirements will be subject to rejection. Rejected submittals shall be corrected and re-submitted for approval at no additional cost to the CONTRACTOR.

CQA SUBCONTRACTOR submittals shall clearly indicate the specific confirmation data necessary to review the information provided. A bold arrow shall be used to indicate the specific confirmation data on the submittals. The CQA SUBCONTRACTOR shall include, directly above the arrow, the specific Subcontract Document reference. Failure to provide the information in this format may require the CQA SUBCONTRACTOR to resubmit the respective submittal(s).

2.1.7 Receiving Inspections

The CQA SUBCONTRACTOR shall perform receipt inspections, including: observations related to transportation and handling and storage of the geosynthetics and bentonite materials. Receipt inspections will not be considered complete until the geosynthetic materials have been received and inspected at the Construction Site undamaged and the documentation complies with the Construction Subcontract Exhibit "E" Technical Specifications.

Receipt inspections shall be completed within 7 days of receipt. Receipt inspection reports shall be submitted to the CONTRACTOR within 7 days after completion of inspection.

2.1.8 Review Construction Subcontractor's Submittals

The CQA SUBCONTRACTOR shall review the Construction Subcontractor's engineering submittals listed (submittals grayed out do not have to be reviewed) in Attachment C.

The CQA SUBCONTRACTOR shall review the calibration data for testing equipment and instrumentation used for the construction activities, including pugmill scales.

Submittal reviews shall be completed with 4 work days of receipt.

2.1.9 As-Built Drawings and Specifications

2.1.9.1 Progress As-Built

During construction, the CQA SUBCONTRACTOR shall maintain an up-to-date full size set of Construction Subcontract drawings and technical specifications at the construction site as an accurate record of approved deviations between work subjected to CQA oversight as shown on the documents and work as installed. These documents shall be available to for inspection at any time during regular business hours. The Construction Subcontract drawings and technical specifications subjected to CQA oversight shall be redline marked to show the following information, but not limited thereto:

- Design Change Notices (DCN). Design changes to the Drawings and Technical Specifications shall be relined marked on the document and surrounded by a “cloud” or by a side bar. A revision triangle referencing the DCN number shall be shown with each cloud and side bar.
- The locations and description of any changes within a building or structure, including underground utilities within such facility.
- Correct grade or alignment of roads, structures, and utilities if any changes were made from the Drawings.
- Correct elevations if changes were made in site grading from the Drawings.
- Approved changes in details of design or additional information obtained from working drawings including, but not limited to, electrical system components, mechanical system components, fabrication erection, dimensions of equipment foundations, etc.
- Where the Drawings or Technical Specifications allow options, only the option actually used in the construction shall be shown.
- Underground systems shall be located both horizontally and vertically with an accuracy of +/- 6 inches using the Washington State Plane coordinate system.

2.1.9.2 As-Built Surveys

The CQA SUBCONTRACTOR's surveyor shall perform as-built surveys to demonstrate the Cells' subgrade; lysimeter and liner system layer thicknesses (top of admix layer, top of secondary drainage layer, top of primary drainage layer, and top of operations layer); leachate collection, leachate transmission, and leachate storage tank systems; and pipeline alignments meet the requirements specified in the Construction Subcontract drawings and technical specifications. As-built surveys shall be performed on a 50-foot grid with a

horizontal and vertical accuracy of 0.1-foot, unless specified otherwise. Surveys shall also include toe of slope, crest of slope, grade breaks, change in direction, anchor trench, cell boundary, and sumps.

The as-built survey shall be shown on as-built drawings and in a table that includes each 50-foot grid point and its corresponding Washington State Plane coordinate system Northing, Easting, and Elevation. Table shall include the design and as-built cell subgrade elevation; elevation of each liner system layer; and the thickness of each liner system layer. As-built surveys shall be completed and submitted to the CONTRACTOR before the placement of the next overlying liner system layer and within 14 calendar days after construction of the liner system layer is completed.

Drawings prepared by the CQA SUBCONTRACTOR shall be prepared in accordance with Exhibit "B", SC 4.3 SUBCONTRACTOR FURNISHED DRAWINGS, DATA AND SAMPLES. Surveying shall be performed by or under the direction of a professional land surveyor registered in the State of Washington. As-built survey drawings shall be sealed by a professional surveyor licensed within the state of Washington.

It is expected that multiple mobilizations or continuous survey will be required to support the Construction Subcontractor's work schedule.

2.1.10 Meetings

The CQA SUBCONTRACTOR shall attend and participate in weekly progress meetings administered by the CONTRACTOR. In addition, the CQA SUBCONTRACTOR shall plan other supplemental meetings, as necessary, for coordination of activities with ERDF Operations Subcontractor, the CONTRACTOR, and others.

2.2 WORK EXCLUDED

This Scope of Work does not include the following related work:

- CQA SUBCONTRACTOR's support trailers and utilities
- Construction work specified in Exhibits E and F. The Technical Specifications in Exhibit E and the Drawings in Exhibit F are copies from the Construction Subcontractor's Subcontract and are provided for the CQA SUBCONTRACTOR's use to plan CQA activities.
- Cultural/ecological assessments or reviews
- Radiological control support/personnel monitoring
- Supplying radiological postings (signs and labels)

2.3 CONTRACTOR/GOVERNMENT FURNISHED EQUIPMENT/SERVICES

CONTRACTOR furnished equipment and services are listed in Exhibit "B" SC 5.1, SC 5.2, SC 5.3, and SC 5.4.

2.4 RELATED WORK

2.4.1 Integrated Work Control (IWC)

The CQA SUBCONTRACTOR's Work performed within the Construction Subcontractor's work area shall be conducted in accordance with the Construction Subcontractor's Integrated Work Control Program (IWCP). The Construction Subcontractor's IWCP requirements are specified in Exhibit "B" SC-6.7 and Exhibit "K" of the Construction Subcontract. The CQA SUBCONTRACTOR shall ensure CQA SUBCONTRACTOR's personnel are trained and qualified in accordance with the Construction Subcontractor's IWCP.

2.4.2 Integrated Safety Management System (ISMS)

Work shall be conducted in accordance with the CONTRACTOR's Integrated Safety Management System (ISMS) specified in Exhibit "G". The CQA SUBCONTRACTOR shall ensure the CQA SUBCONTRACTOR's personnel are trained and qualified and that work is conducted in accordance with ISMS. Completion of the ISMS Matrix (Exhibit "G" Form G-01) and the CQA SUBCONTRACTOR's Health and Safety Program are required prior to start of on-site work activities in accordance with Exhibit "T".

2.4.3 Conduct of Operations (CONOPS)

The purpose of WCH's Conduct of Operations program is to ensure that facility operations are managed, organized, and conducted in a manner that results in a high level of performance and therefore contributes to safe and reliable operations. The CQA SUBCONTRACTOR shall implement a conduct of operations program in accordance with Exhibit "K".

2.4.4 Testing Laboratory Qualifications

The following qualifications shall be met by the CQA SUBCONTRACTOR's off-site laboratories:

For Soils and Soil/Bentonite Admix:

- American Association of State Highway and Transportation Officials (AASHTO),
- National Voluntary Laboratory Accreditation Program (NVLAP),
- American Association for Laboratory Accreditation (AALA) program,
- Army Corps of Engineers Soil Lab Certification based upon AMRL, or
- International Accreditation Service (IAS) accreditation.

For Geosynthetics:

- Geosynthetic Accreditation Institute (GAI) - Laboratory Accreditation Program

2.5 WORK LOCATION

This Work will be at the Environmental Restoration Disposal Facility (ERDF) located on the Hanford Site near Richland, Washington.

2.6 WORK SCHEDULE AND MILESTONES

The work schedule associated with this Work is specified in Exhibit "B", SC 4.4 "Commencement, Progress, and Completion of Work".

2.7 SUMMARY OF DELIVERABLES

All deliverables associated with this work are defined in this Scope of Work and in Subcontract Exhibits (e.g. Exhibit "E", Exhibit "F", Exhibit "I", and Exhibit "C").

3.0 FUNCTIONAL REQUIREMENTS**3.1 CODES, STANDARDS, AND REGULATIONS**

The applicable codes, standards and regulations requirements are identified in Section 2 and in the Subcontract Documents.

3.2 ENGINEERING

The Engineering design requirements are defined in Section 2 and in the Subcontract Documents.

3.3 CONSTRUCTION

The construction requirements are defined in Section 2 and in the Subcontract Documents.

3.4 PROCUREMENT

Procurement requirements for this Subcontract are specified in Exhibit "A" General Conditions and Exhibit "B" Special Conditions.

3.5 QUALITY ASSURANCE

The CQA SUBCONTRACTOR shall prepare, submit, and implement a Quality Assurance Program (QAP) meeting the requirements specified in Exhibit "A" GC 7.30.

The CQA SUBCONTRACTOR's QAP shall include the applicable elements identified on the *SUPPLIER QA PROGRAM REQUIREMENTS* form in Attachment B.

The QAP shall be submitted for review in accordance with Exhibit "I".

3.6 HEALTH AND SAFETY

The Health and Safety requirements are defined in Exhibit "G".

3.6.1 Nuclear Densometer

For all radioactive materials, radiation sources, and/or radiation generating devices brought on to the Hanford Site by the CQA SUBCONTRACTOR, the CQA SUBCONTRACTOR shall submit documentation to the CONTRACTOR of the authorization to possess such radioactive material, radiation sources, and/or radiation-generating device. A form showing the ownership of material/equipment issued by the DOE, or a license to possess radioactive material, radiation sources, or radiation generating devices from the U.S. Nuclear Regulatory Commission (USNRC) or Agreement State, is required. The SUBCONTRACTOR shall maintain records of all training required under their operational procedures and verification of leak check for sources (if required).

Prior written approval by the CONTRACTOR'S Radiological Control Organization shall be received before the CQA SUBCONTRACTOR can bring the above radioactive materials, radiation generating devices, or radioactive sources on to the CONTRACTOR's work sites. The CONTRACTOR'S Radiological Control Manager's written approval will include direction on use, movement, source handling, surveys/integrity tests, and other requirements appropriate for the source type or radiation-generating device being used considering the site conditions.

The CQA SUBCONTRACTOR shall maintain documentation of training to utilize all radiation generating devices and/or radioactive sources on site. The training shall comply with the requirements found in Radiation Protection Procedure RC-1-9.1, Radiation Safety Training.

The CQA SUBCONTRACTOR shall provide a secure storage facility for nuclear densometer(s) stored at the project site. The storage facility shall meet the CQA SUBCONTRACTOR's license requirements and the Hanford site requirements. The storage facility will be posted as a Radioactive Material Area (RMA). RadWorker I training is required to access a RMA posted area. The CQA SUBCONTRACTOR is responsible for providing RadWorker I training to employees accessing the RMA posted storage facility.

3.6.1.1 Required Subcontractor Submittals (see Exhibit I)

- Request for authorization to possess radioactive material or radiation generation instrumentation and supporting documentation.
- Copies of source or radiation-generating device operating procedures.
- Approved authorization to possess radioactive material, radiation sources, and/or radiation-generating devices.

3.6.1.2 Required Minimum Documentation-Available for CONTRACTOR Review

- Documentation of training on radiation sources and/or radiation-generating devices.

3.7 TECHNICAL CAPABILITY AND QUALIFICATIONS

The technical capabilities and qualifications requirements are defined in Section 2 and in the Subcontract Documents.

3.8 TRAINING

In the performance of work under this Subcontract, the CQA SUBCONTRACTOR shall adhere to the training requirements as specified in the Subcontract. The CQA SUBCONTRACTOR shall prepare and submit a training matrix to demonstrate through properly documented records that personnel performing work on site have completed the required training, qualification/certifications, and medical requirements specified in the Subcontract prior to commencement of work.

CQA SUBCONTRACTOR's site personnel shall attend site specific training furnished by the CONTRACTOR including:

- IWCP Training (craft, supervisors[foreman], etc) (estimated at 1 hour for craft and 2-4 hours for supervisors)
- ISMS Training (every on-site employee prior to performing work) (computer based or class room 3 hours)
- HGET (Estimated duration 4 hours – computer based)

The CQA SUBCONTRACTOR is responsible for providing other applicable training and qualifications (e.g. fall protection, ladder and scaffold safety, forklift qualifications, manlift qualifications, excavation competent person, etc.).

3.9 ENVIRONMENTAL

The Environmental requirements associated with this work are defined in Exhibit "J".

4.0 REFERENCE DOCUMENTS

- ATTACHMENT A CONSTRUCTION QUALITY ASSURANCE PLAN FOR ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) CELLS 9 & 10
- ATTACHMENT B SUPPLIER QA PROGRAM REQUIREMENTS
- ATTACHMENT C CONSTRUCTION SUBCONTRACT SUBMITTALS
- EXHIBIT "E" CONSTRUCTION SUBCONTRACT – TECHNICAL SPECIFICATIONS
- EXHIBIT "F" CONSTRUCTION SUBCONTRACT - DRAWINGS

5.0 OTHER REQUIREMENTS

All required submittals are listed in Exhibit "I", *Subcontractor Submittal Requirements Summary*.

ATTACHMENT A

CONSTRUCTION QUALITY ASSURANCE PLAN

FOR

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)

CELLS 9 & 10

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP			
1. <input checked="" type="checkbox"/> Work may proceed. 2. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4. <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5. <input type="checkbox"/> Permission to proceed not required.			
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.			
	CIVIL STRUCTURAL/ GEOTECHNICAL	ELECTRICAL	MECHANICAL
	PROCESS NUCLEAR	CLDD	PROJECT REF.
	ENVIRONMENTAL	WASTE MANAGEMENT	SAFETY
	INDUSTRIAL HYGIENE	HAZ. PROTECTION	OS
	PA/COM	FIELD ENGINEER	OTHER
CHECK REVIEW REQUIREMENT			<input checked="" type="checkbox"/>
REVIEWED BY		W.A. Palan	
		11-24-2009	
	DOCUMENT ID NUMBER		
	S06X524A000CN03-05-017-001		
	SC/P.O. No.	SSRS ITEM	SUBMITTAL

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

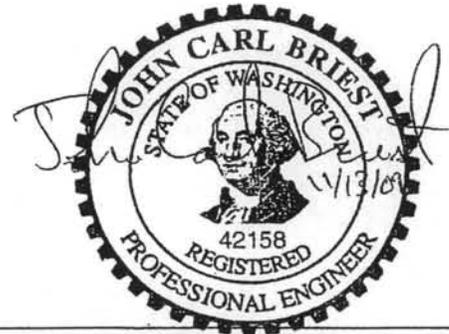
FOR ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) CELLS 9 & 10

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NOV 19 2009

**WCH - DOCUMENT
CONTROL**

DOCUMENT CONTROL *mjp 11/24/09*



Rev.	Date	Reason for Revision	Originator	Checker	Project Engineer	LEAD Design Eng.
0	11/13/09	Issued for Award	MRH	<i>[Signature]</i>	<i>[Signature]</i>	SCB
Washington Closure Hanford, LLC		RIVER CORRIDOR CLOSURE CONTRACT		Job No. 14655	Contract No. 0600X-QA-G0005	
				Page 1	of 51	

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)
CONTENTS

1.0 INTRODUCTION4
1.1 PURPOSE.....4
1.2 SCOPE4
1.3 RELATIONSHIP TO WCH'S QUALITY ASSURANCE PROGRAM5
1.4 CHANGE CONTROL PROCEDURES5
2.0 PROJECT ORGANIZATION5
2.1 RESPONSIBILITY AND AUTHORITY6
2.1.1 Owner6
2.1.2 Permitting Agencies.....6
2.1.3 River Corridor Closure Contractor6
2.1.4 Operations Subcontractor.....7
2.1.5 QA/QC7
2.1.6 Construction Manager.....7
2.1.7 Engineering STR.....7
2.1.8 Designer7
2.1.9 Construction STR.....7
2.1.10 CQA STR.....8
2.2 PROJECT MEETINGS9
2.2.1 CQA/Construction Coordination Meeting9
2.2.2 Plan of the Day Meetings.....10
2.2.3 Weekly Progress Meetings10
2.2.4 Non-Conformance Meetings.....11
2.3 HOLD POINTS11
3.0 PERSONNEL QUALIFICATIONS AND TRAINING11
3.1 CQA OFFICER.....11
3.2 CQA ENGINEER12
3.3 CQA FIELD PERSONNEL.....12
4.0 INSPECTION ACTIVITIES12
4.1 EARTHWORKS.....13
4.1.1 Excavation.....13
4.1.2 Fill.....13
4.2 ADMIX SOIL LINER14
4.2.1 Pre-Construction14
4.2.2 Test Fill.....15
4.2.3 Construction.....17
4.2.4 Post Construction.....19
4.3 GRAVEL DRAINAGE LAYERS20
4.3.1 Post-Construction.....20

4.4	OPERATIONS LAYER.....	20
4.4.1	Construction.....	20
4.4.2	Post-Construction.....	21
4.5	ANCHOR, UTILITY, AND SIDE SLOPE RISER PIPE TRENCHES.....	21
4.5.1	Construction.....	21
4.5.2	Post-Construction.....	22
4.6	HDPE GEOMEMBRANE LINER.....	22
4.6.1	Preconstruction.....	22
4.6.2	Construction.....	24
4.6.3	Post-Construction.....	30
4.7	LEACHATE COLLECTION SYSTEM (LCS).....	30
4.7.1	Pre-Construction.....	31
4.7.2	Construction.....	31
4.7.3	Post-Construction.....	36
5.0	DOCUMENTATION.....	36
5.1	DAILY REPORTS.....	36
5.2	INSPECTION DATA SHEETS.....	38
5.3	NONCONFORMANCE REPORTING.....	38
5.4	DESIGN CHANGES AND CLARIFICATIONS.....	39
5.5	PROGRESS REPORTS.....	39
5.6	FINAL DOCUMENTATION.....	40
5.7	STORAGE OF RECORDS.....	40
6.0	REFERENCES.....	40

TABLES

TABLE 4-1.	SOIL MINIMUM TESTING REQUIREMENTS.....	45
4-1.1	EARTHWORK.....	45
4-1.2	ADMIX SOIL LINER.....	46
4-1.3.	GRAVEL DRAINAGE LAYERS.....	47
4-1.4	OPERATIONS LAYER.....	47
4-1.5	ANCHOR TRENCH/SIDE SLOPE RISER PIPE TRENCH.....	47
TABLE 4-2.	GEOSYNTHETIC MATERIALS MINIMUM TESTING REQUIREMENTS.....	48
4-2.1.	HDPE GEOMEMBRANE.....	48
4-2.2	GEOTEXTILE.....	49
4-2.3.	GEOCOMPOSITE.....	49
4-2.4	GEONET.....	50
TABLE 4-3.	ERDF CONSTRUCTION HOLD POINTS.....	51

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) has contracted with Washington Closure Hanford, LLC (WCH) to construct two additional cells (Cells 9 & 10) at the Environmental Restoration Disposal Facility (ERDF) on the Hanford site near Richland, Washington. Cells 9 & 10 will be constructed adjacent to the existing cells and the liner systems will be joined to form a single uninterrupted liner system. This Construction Quality Assurance Plan (CQAP) describes the construction quality assurance activities required during the construction of Cells 9 & 10.

1.1 PURPOSE

During facility construction, Construction Quality Assurance (QA) activities will be required to ensure that:

- (1) Components are constructed in accordance with the plans and specifications; and
- (2) Requirements of agencies related to documentation are satisfied. The agencies involved with ERDF are the DOE and the U.S. Environmental Protection Agency (EPA).

This CQAP has been prepared to describe the activities that will be performed during construction to satisfy these objectives. Procedures invoked by the CQAP are intended to identify problems that may occur during construction and to document that these problems are corrected before construction is complete.

This CQAP is intended to satisfy the regulatory requirements and guidance established in 40 CFR 264.19 (EPA), WAC 173-303-335 (Ecology), and EPA/600/R-93-182 *Quality Assurance and Quality Control for Waste Containment Facilities, 2nd Edition, Waste Containment Facilities, ASCE Press, 2007*.

This CQAP is to function and be executed independently of the Construction SUBCONTRACTOR's Construction Quality Control (CQC) program, except when nonconformance in the Construction SUBCONTRACTOR's program or product are identified. The Construction SUBCONTRACTOR's CQC activities during construction, including test methods, location, frequency, and similar requirements, are defined in the Technical Specifications for the construction subcontract and are not modified in any way by this CQAP.

1.2 SCOPE

This CQAP establishes general administrative and documentation procedures. With respect to specific inspection and testing activities, this plan addresses only those activities associated with construction of the disposal trench and the support facilities that will be performed for Cells 9 & 10. Specific work items include:

- Excavation
- Soil testing
- Construction of admix soil liner test fill
- Production and placement of admix soil liner
- Construction of anchor trenches and side slope riser trenches
- Procurement, testing, and installation of geosynthetics
- Installation of components and facilities for leachate collection and removal system and utility zone monitoring system
- Placement of gravel drainage layers
- Placement of the operations layer
- Site grading (civil survey, layout, etc)

1.3 RELATIONSHIP TO WCH'S QUALITY ASSURANCE PROGRAM

This CQAP and the CQA SUBCONTRACTOR's Quality Assurance Program (QAP) are secondary documents, developed under the requirements of the project QA program embodied in the current approved versions of the *River Corridor Closure Contract Quality Assurance Program Description (QAPD)*, (WCH-51). The QAPD is the site-wide River Corridor Closure Contractor's quality assurance document. The CQAP draws upon the records management, document control, technical review, and other procedural resources invoked by the QAPD.

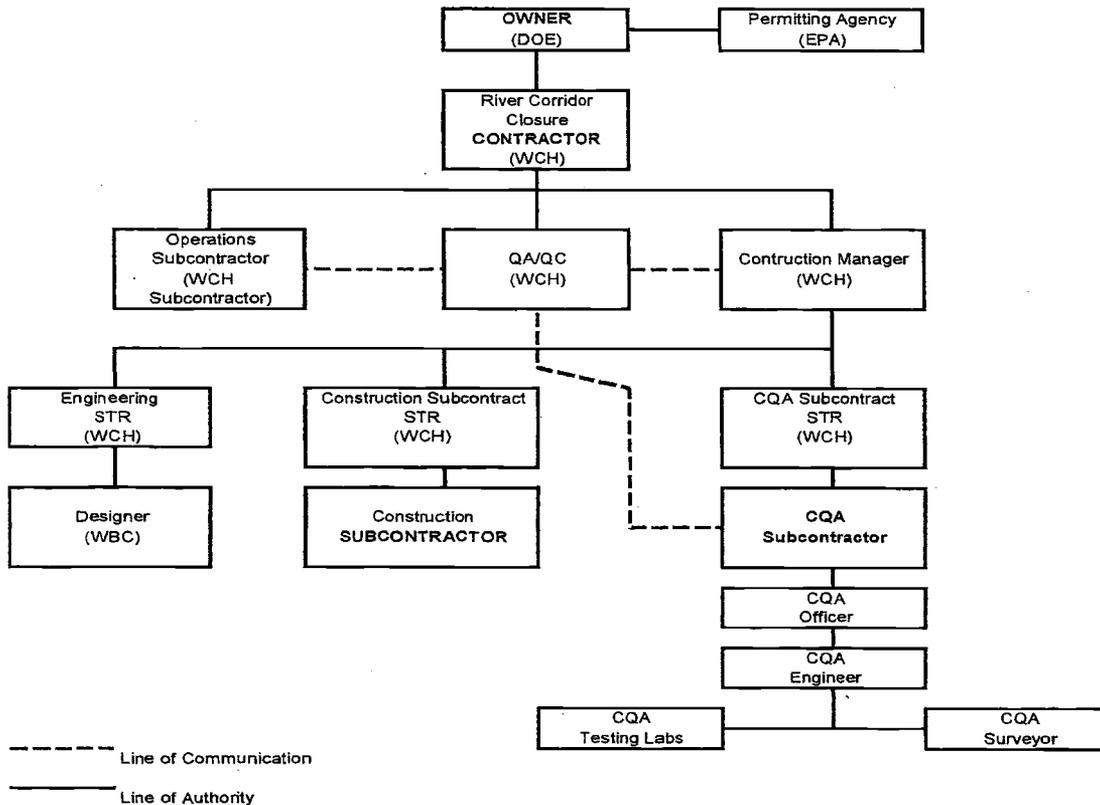
1.4 CHANGE CONTROL PROCEDURES

The CQAP and implementing procedures are subject to the change control requirements defined by the procedures established in WCH's QAPD.

2.0 PROJECT ORGANIZATION

This section describes the project organization for the construction of the ERDF Cells 9 & 10. The following sub-sections address the organizations involved in the ERDF construction, their respective roles in construction activities, and methods of interactions between organizations.

Figure 1. ERDF Construction/Quality Assurance Organization



2.1 RESPONSIBILITY AND AUTHORITY

The quality assurance organization chart for ERDF construction is shown on Figure 1. Each major organization is described in the following sections.

2.1.1 Owner

The OWNER of the ERDF is the DOE - Richland Operations Office (DOE).

2.1.2 Permitting Agencies

Cells 9 & 10 of the ERDF are being constructed to meet regulations established by the EPA. This CQAP is specifically designed to support those regulations.

2.1.3 River Corridor Closure Contractor

WCH is the River Corridor Closure Contractor for ERDF and is responsible for design, construction, and operation of the ERDF. WCH interfaces with DOE and the regulatory agencies and is responsible for ensuring that the permitting requirements of the regulatory

agencies are satisfied. WCH manages the activities of the Designer, Construction SUBCONTRACTOR, (SUBCONTRACTOR) and CQA SUBCONTRACTOR. These three activities may be conducted by different subcontractors to maintain the required degree of independence. WCH has procurement authority for ERDF Subcontracts.

2.1.4 Operations Subcontractor

The ERDF is operated by WCH for the DOE. WCH has subcontracted the operation of ERDF to an Operations Subcontractor. During construction, WCH will be responsible for review and approval of any field changes which would affect facility operations.

2.1.5 QA/QC

WCH provides quality assurance and quality control (QA/QC) oversight of the SUBCONTRACTOR and CQA SUBCONTRACTOR'S activities during construction.

2.1.6 Construction Manager

The Construction Manager, an employee of WCH, has overall responsibility for construction of the ERDF cells. The Construction Manager directs the activities of the construction project and personnel, including the Engineering Subcontract Technical Representative (STR), Construction STR, and CQA STR.

2.1.7 Engineering STR

The Engineering (STR), an employee of WCH, serves as the point of contact between the Designer and WCH. The Engineering STR oversees the preparation and review of technical documents related to the design of ERDF Cells 9 & 10.

2.1.8 Designer

ERDF Cells 9 & 10 were designed by WCH through their subcontractor, Weaver Boos Consultants, LLC (WBC). The responsibilities of the Designer include clarifying and interpreting the plans and specifications, assisting with the preparation of Design Change Notices (DCNs), incorporation of new or changed requirements, and reviewing submittals as directed by the Engineering STR. The Designer may also assist with document distribution and control if directed by the Engineering STR.

2.1.9 Construction STR

The Construction STR, an employee of WCH, serves as the point of contact between the Construction SUBCONTRACTOR and WCH. The Construction STR oversees the daily construction field activities and is the on site representative for WCH.

2.1.9.1 Construction SUBCONTRACTOR. The Construction SUBCONTRACTOR (SUBCONTRACTOR) performs the work activities associated with actual construction of ERDF.

Cells 9 & 10. The SUBCONTRACTOR is responsible for implementing their own internal QC activities as defined in the Construction Subcontract, approved submittals, and other supporting documentation. The SUBCONTRACTOR reports directly to and receives direction from the WCH Construction STR. This document also refers to an Installer. The Installer is a subtier under the Construction SUBCONTRACTOR and refers to the geosynthetics installer.

2.1.10 CQA STR

The CQA STR, an employee of WCH, serves as the point of contact between the CQA Subcontractor and WCH. The CQA STR oversees the daily CQA field activities and is the on site representative for WCH.

2.1.10.1 CQA Subcontractor. A third-party CQA subcontractor shall perform the work specified in the CQAP. The CQA Officer, an employee of the CQA Subcontractor, has the overall responsibility of implementing the CQAP and directly supervises the on site CQA Engineer. The CQA Officer shall be a Registered Professional Engineer in the State of Washington and has the authority to provide certification that the ERDF cells were constructed in accordance with the Permitting Agency-approved CQAP and construction Technical Specifications and Drawings.

The CQA Subcontractor shall review the SUBCONTRACTOR'S plans and other submittals, as required by the CONTRACTOR. The CQA Subcontractor shall also be responsible for training and qualifying CQA inspection personnel on requirements, procedures, scheduling, and inspection activities, and ensuring that the CQA testing laboratories and surveyors conform to CQA Subcontract requirements. The CQA Subcontractor shall ensure that sample custody procedures are followed and test data are accurately reported and maintained for preparation of periodic reports. The most important duty of the CQA Subcontractor is confirming that the facility was constructed in accordance with plans and specifications approved by the permitting agency. The CQA Subcontractor shall report directly to and receive direction from the CQA STR.

2.1.10.2 CQA Engineer. The CQA Engineer works on site under the direction of the CQA Officer and manages the on site quality assurance personnel and CQA work; location and frequency of tests, schedule and monitor results of tests, identify deficiencies and verify that deficiencies have been corrected, complete reports and provide peer review of completed data, testing, and oversight activities. CQA field personnel work under the direction of the onsite CQA Officer and perform testing and observations in accordance with the CQAP.

2.1.10.3 CQA Testing Labs. CQA testing labs conduct the CQA tests specified in the CQAP that are not completed on site. CQA Testing labs shall be provided by the CQA Subcontractor.

2.1.10.4 CQA Surveyor. The CQA Surveyor shall provide surveys necessary for conducting the work specified in the CQAP. The CQA Surveyor shall be provided by the CQA Subcontractor. CQA surveying work shall be performed under the direction of a registered professional land surveyor in the State of Washington.

2.2 PROJECT MEETINGS

This section includes a discussion of various progress and status meetings to be held throughout construction activities. The intent of the meetings is to ensure communication between organizations involved in the construction of ERDF cells.

2.2.1 CQA/Construction Coordination Meeting

A meeting will be held to resolve any uncertainties following the award of the Construction and CQA Subcontracts. The meeting will include the organizations involved in the Construction and CQA activities, including representatives of DOE and regulatory agencies as agreed upon. The topics of this meeting will include but are not limited to:

- Reviewing the responsibilities of each organization;
- Integrated work control;
- Interface protocol (e.g. points of contact, notification process, etc.);
- Reviewing lines of authority and communication for each organization;
- Providing each organization with CQA documents and supporting information;
- Familiarizing each organization with the CQAP and its role relative to the design criteria, plans, and specifications;
- Determining any changes to the CQAP that may be needed to document that the facility will be constructed to meet or exceed the specified design requirements;
- Discussing the established procedures or protocol for observations and tests including sampling strategies;
- Discussing the established procedures or protocol for handling construction deficiencies, repairs, and retesting, including “stop work” conditions;
- Reviewing methods for documenting and reporting inspection data;
- Reviewing methods for distributing and storing documents and reports;
- Reviewing work area security and safety protocol;
- Reviewing the proposed project schedule;

- Discussing procedures for the location and protection of construction materials and for the prevention of damage of the materials from inclement weather or other adverse events; and
- Conducting a site walk-around to review construction material and inspect equipment storage locations.

The meeting will be documented in the CQA Subcontractor's meeting minutes.

2.2.2 Plan of the Day Meetings

CQA representative(s) shall attend the Construction SUBCONTRACTOR's daily Plan of the Day meetings at the work site. The purpose of the meetings is to:

- Discuss any health and safety issues;
- Review the previous day's activities and accomplishments;
- Review the work location and activities for the day;
- Discuss the SUBCONTRACTOR's personnel and equipment assignments for the day;
- Review any new test data; and
- Discuss any potential construction problems.

2.2.3 Weekly Progress Meetings

CQA representative(s) shall attend the CONTRACTOR's weekly progress meetings with the Construction SUBCONTRACTOR. The purpose of the meetings is to:

- Review the previous weeks activities and accomplishments;
- Review claims, change orders, delays, and similar items;
- Review planned activities for the upcoming week;
- Review project schedule, including but not limited to, project schedule and hold point schedule;
- Finalize resolution of problems from the previous week; and
- Discuss the potential problems with the work planned for the upcoming week.

This meeting's minutes will be documented by the CONTRACTOR.

2.2.4 Non-Conformance Meetings

Meetings will be convened as necessary to address non-conformance discovered during inspection. Deficiencies observed during construction by CQA personnel will be brought to the attention of the CONTRACTOR's STR and the Construction SUBCONTRACTOR. The Construction SUBCONTRACTOR shall document and disposition the non-conformance in accordance with the Construction SUBCONTRACTOR's Non-Conformance Reporting (NCR) procedures. The CQA Subcontractor and Designer will participate in nonconformance review meetings as requested by the WCH.

2.3 HOLD POINTS

Hold points are established for certain key activities as identified in Table 4-3. At these points, the SUBCONTRACTOR shall cease work on the affected activity until it has been reviewed by the appropriate CQA personnel. The Construction SUBCONTRACTOR shall provide CQA personnel at least one week notice prior to a hold point inspection.

3.0 PERSONNEL QUALIFICATIONS AND TRAINING

This section describes the qualifications and training required for CQA personnel.

The CQA Subcontractor shall develop and submit a Training Matrix for each position required for performance of work on the CQA Subcontract. The CQA Subcontractor is responsible for qualification, certification, and maintenance of these requirements for the personnel fulfilling these positions. The CQA Subcontractor shall submit a certification form documenting the qualifications of CQA personnel to the CONTRACTOR.

3.1 CQA OFFICER

The CQA Officer shall have landfill construction certification experience. The CQA Officer shall possess, as a minimum, a Bachelor's degree and Washington State Professional Engineer license in civil or construction engineering, engineering geology, or a closely related discipline, and shall have at least 10 years practical, technical, and managerial experience to successfully direct the CQA activities discussed in this plan. The CQA Officer's qualifications shall be documented by training records, copies of licenses, and professional resume.

The CQA Officer shall receive training in the requirements of the CQAP and the CQA Subcontractor's QAP, including but not limited to documentation, receiving inspection, equipment calibration, design control, and personnel training. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

3.2 CQA ENGINEER

The CQA Engineer shall possess, at a minimum, a Bachelor's degree in civil or construction engineering, engineering geology, or a closely related discipline, and shall have sufficient practical, technical, and managerial experience to successfully direct the on-site CQA activities specified in this CQAP. The CQA Engineer's qualifications shall be documented by training records, copies of licenses, and professional resume.

The CQA Engineer shall receive training in the requirements of the CQAP and the CQA Subcontractor's QAP, including but not limited to documentation, receiving inspection, equipment calibration, design control, and personal training. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

3.3 CQA FIELD PERSONNEL

CQA field personnel shall possess a high school diploma and at least two years of construction-related experience, including at least one year of experience conducting CQA monitoring for earthworks and geosynthetics installation, or a Bachelor of Science degree from a four year college or university and at least one year of experience conducting CQA monitoring for earthworks and geosynthetics installation.

Qualifications of CQA Personnel shall be documented by training records and professional resumes. Prior to undertaking project activities, CQA Personnel shall receive training in the requirements of the CQAP, the CQA Subcontractor's QAP, and applicable technical requirements. In addition, CQA Personnel shall be trained in the use of visual-manual soil classification techniques. Project plans and specifications shall be reviewed. The purpose of the training is to provide CQA staff with a clear understanding of expected conditions, methods of construction, and the scope of plans and specifications. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

4.0 INSPECTION ACTIVITIES

This section describes the inspection activities (observations and tests) that will be conducted by the CQA Subcontractor during construction of the ERDF trench and support facilities. The following subsections address each facility component separately and, if appropriate, are further subdivided into sections on pre-construction, construction, and post-construction testing and observation activities unique to each component. Soil testing requirements are summarized in Table 4-1. Geosynthetic testing requirements are summarized in Table 4-2. Hold points during construction are summarized in Table 4-3.

Sampling of soil, geosynthetic materials, and other materials will be required for testing purposes. Every sample shall be assigned a unique identification number which describes the sample location and type. Sample numbers shall be recorded by the CQA Subcontractor.

4.1 EARTHWORKS

4.1.1 Excavation

Requirements for excavation activities are described in Exhibit "D" Scope of Work, Technical Specifications, and Drawings. During excavation, CQA Personnel shall generally observe the excavated material and subgrade conditions and shall perform the following activities:

- Document moisture seeps and that soft, organic, and otherwise undesirable materials are removed.
- Notify the CONTRACTOR immediately if changed or unexpected geologic conditions are encountered.
- Coordinate with the CQA Surveyor to confirm that the depth and slope of the excavations, sumps, ramps, side slope riser trenches, surface water drainage ditches, roadways, foundations, and other construction components meet design requirements.

Observations shall be recorded on daily field monitoring report forms, drawings, and geologic maps as appropriate.

4.1.2 Fill

Requirements for fill are described in Exhibit "D" Scope of Work, Technical Specifications, and Drawings. CQA Personnel shall perform the following activities:

- Prior to placement of any structural backfill or roadway top course material in the trench or on the embankment, verify that the subgrade has been prepared (scarified, moisture-conditioned, and compacted) in accordance with the requirements of the Technical Specifications. CQA Personnel shall test the subgrade with in-place density methods at the frequency specified in Table 4-1.
- During fill and roadway top course placement in the trench or on the embankment, conduct tests and observations to document that the quality of compacted fill meets project specifications. This will include visual observation, measurement of lift thickness, verifying grain size analysis, determining moisture-compaction characteristics, and measuring in-place density and moisture content, and other tests. Field in-place density tests shall be conducted as listed in Table 4-1. Additional tests may be conducted at the discretion of the CQA Officer.
- Coordinate with the CQA Surveyor to verify that final lines and grades conform to design requirements.
- Review SUBCONTRACTOR's soil testing and field density data to verify that materials satisfied the requirements of the Technical Specifications and that specified compaction was achieved.

Observations shall be recorded on daily field monitoring report forms, drawings, and test data forms.

Provide a daily report to the CQA STR that contains, at a minimum, fill quantities, locations, observations, problems, NCRs, deficiencies, CQA hold points witnessed/released, and observed safety issues. The report shall be submitted on the following work day.

4.2 ADMIX SOIL LINER

The requirements for the admix soil liner are described in Specification No. 0600X-SP-C0076, Cell Construction-Admix Layer, of the Technical Specifications. The CQA Personnel shall perform the following activities:

4.2.1 Pre-Construction

Preconstruction CQA activities include review of bentonite manufacturer certificates, inspection and testing of base soil preparation, inspection and testing of admix soil liner preparation, and inspection and testing of test fill construction. Each is described below:

Base soil liner materials shall be inspected to document that they satisfy the requirements of the specifications. Material inspection shall continue throughout the liner construction period. If base soil material for admix production is obtained onsite, the inspections can be performed as the material is excavated or as it is placed in the storage pile. Visual observation and classification of the excavated base soils used in admix production shall be performed. Unsuitable material shall be rejected. If base soil material for the admix layer material is obtained offsite, inspection of the soil shall be conducted as it arrives at the construction site. For borrow areas containing non-uniform materials, unacceptable soil material shall be segregated as it is excavated. CQA Personnel shall observe segregation operations carefully and document that suitable material is retained for liner construction. Changes in color or texture may be indicative of a change in soil type or soil moisture content. The soil shall be inspected for roots, stumps, large rocks, and other deleterious materials. No rocks greater than 2 inches will be allowed in the admix layer.

During mixing, CQA Personnel shall observe production and shall test the admix to document that the specified amount of bentonite is mixed uniformly with the base soil, and that water is uniformly added to the admix in the amount necessary to achieve the specified design. The bentonite content of the admix liner material shall be determined by belt scale measurements and sieve analysis.

A sufficient number of samples of the constituent materials and finished admix, as determined by the CQA Officer, shall be tested to document that material properties are within the ranges stated in the specifications. These tests shall include at least the following:

- Bentonite yield manufacturer's certificates – as indicated in Table 4-1.

- Remolded Permeability (Admix) – as indicated in Table 4-1. Additional permeability testing shall be performed whenever the base soil has < 20% passing the U.S. No. 200 Sieve by dry weight. For this testing, the base soil shall be mixed with 12% bentonite by dry weight and have moisture – density values that fall within the “acceptable zone”, as described in Specification 0600X-SP-C0076. If the permeability results are comparable to those with base soil containing > 20% fines, the base soil may be used. Otherwise, it shall be rejected.
- Soil density/moisture content relationships (Admix) – as indicated in Table 4-1.
- Maximum clod size (Admix) - Periodic visual monitoring.
- Particle size distribution (base soil and admix) (hydrometer and - #200 sieve) – as indicated in Table 4-1.
- Bentonite content of admix by belt scale measurements – as indicated in Table 4-1.
- Atterberg limits (Admix) – as indicated in Table 4-1.
- Natural water content (Admix) – as indicated in Table 4-1.
- Soil Density/Moisture Content Relationship (Admix) – as indicated in Table 4-1.

Samples shall be collected and tested by CQA Personnel. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1. Testing shall be completed and compliance with the specifications established prior to any placement of admix material. Additional samples totaling at least 200 pounds shall be collected by the CQA Personnel and archived at the direction of the CONTRACTOR. The CONTRACTOR shall hold archive samples at their discretion. If the admix properties change due to changes in the base soil or other factors, the CONTRACTOR may change the acceptable moisture and density.

4.2.2 Test Fill

A test fill shall be constructed by the SUBCONTRACTOR to demonstrate the adequacy of the materials, design, equipment, and construction procedures proposed for the admix liner. The primary purpose of the test fill is to document that the specified soil density, moisture content, and permeability values can be achieved consistently in the full-scale facility with the full-scale compaction equipment and procedures.

The test fill shall be constructed to allow determination of the relationship among density, moisture content, and permeability. Field variables can affect this relationship and must be carefully measured and controlled both in the test fill and during construction of the full-scale liner. As a minimum, the following shall be observed, sampled, tested, and documented by the CQA Personnel:

- The compaction equipment type, configuration, and weight

- The number of passes of the compaction equipment
- The method used to breakdown clods before compaction and the maximum allowable clod size
- The method used to control and adjust moisture content, including equilibration time, and the quantity of water to be used in any adjustment
- The speed of the compaction equipment traveling over the liner
- The uncompacted and compacted lift thicknesses
- Types of rutting (depths, widths, etc.).
- Relatively undisturbed samples of the test fill shall be collected by the CQA Subcontractor using Shelby tubes for laboratory permeability tests. The Construction SUBCONTRACTOR will assist in collecting the Shelby tubes.
- Following collection of permeability samples, the holes shall be repaired and the methodology for repairing holes in the soil liner shall be evaluated by CQA Personnel. Holes less than or equal to 2 inches in diameter shall be repaired by backfilling with admix liner or bentonite chips, pellets, or powder in lifts no more than 6 inches thick and hand-tamping with a steel rod or other suitable device to firmly compact each lift. The methods and materials that will be used in the repair process shall be documented by CQA Personnel. Performance of repaired soil liner sections shall be equal to or exceed the performance of undisturbed liner sections. The resulting procedures shall be followed during repair of testing or sampling holes during full-scale liner construction.
- The test fill construction shall include the removal and replacement of a portion of the soil liner to evaluate the method proposed for repair of defective portions of the full-scale liner.
- A Two Stage Borehole (Boutwell) Test (ASTM D6391) shall be performed on the test fill to evaluate large-scale permeability. The Two Stage Borehole (Boutwell) Test shall be installed by the CQA Subcontractor, CQA Personnel shall direct installation of the equipment, perform the test, and evaluate the data with support from the SUBCONTRACTOR.
- Evaluation of layer bonding shall be determined by CQA Personnel using test pits to make visual observations. A minimum of two test pits shall be excavated in each test fill after test fill construction has been completed. The test pits shall be excavated entirely through the test fill using a backhoe, post hole digger or other approved method. Test pit locations shall be determined by CQA Personnel. Test pits will be completed by SUBCONTRACTOR.

The number and frequency of field and laboratory tests to be conducted during the test fill are listed below:

Additional tests may be conducted at the direction of the CQA Officer. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1. The CQA Officer shall compare the results of field and laboratory testing to the required specifications. Any failing tests shall be reported to the CONTRACTOR.

Additional test fills shall be constructed for each borrow source and whenever significant changes occur in the liner material, equipment, or procedures used to construct the soil liner.

4.2.3 Construction

Low-permeability admix liner shall be constructed by using the materials equipment and procedures used in the test fill and as documented by CQA Personnel. Criteria to be used for determining the acceptability of the liner shall be as identified in the project specifications. The CQA process for admix liner are intended to accomplish three objectives:

1. Ensure that the admix liner materials are suitable.
2. Ensure that the admix liner materials are properly placed and compacted.
3. Ensure that the completed liner is properly protected.

Subgrade preparation shall be observed for compliance with the specifications.

To document that proper construction practices are followed, CQA Personnel shall observe the liner material placement and compaction process. During material spreading, the following shall be documented:

- Area to be covered is lightly scarified and moisture conditioned to facilitate bonding;
- Liner material is spread adequately to obtain complete coverage and the specified loose lift thickness;
- Equipment used to transport material does not affect lower material that was previously scarified;
- Oversize clods in the liner material are discarded or reduced in size;
- Soil moisture content is adjusted appropriately in the event of a significant prolonged rain or drought during construction;
- When required, water is adequately spread and incorporated to obtain full penetration through clods and uniform distribution;

- Significant water loss and desiccation cracking before and after compaction are prevented through the use of water application, covering, or other appropriate methods; and
- At tie-in locations, any dry, cracked, or otherwise unsuitable areas of the existing admix is removed.

During the soil liner compaction process, the following shall be documented:

- Compaction equipment is of the same type, configuration, and weight as used in the test fill;
- The equipment speed and number of passes for compaction is the same as used in the test fill;
- Coverage by compaction equipment is uniform, especially at compacted fill edges, in equipment turnaround areas, and at the tops and bottoms of slopes;
- The specified soil density, water content, and permeability throughout each completed lift is achieved. This will be determined by laboratory and field testing;
- Hydraulic Conductivity values obtained for undisturbed soil liner samples are consistent with values obtained for undisturbed samples from the test fill. Undisturbed sample locations are staggered from lift to lift so holes do not align vertically;
- Penetrations or holes resulting from the collection of undisturbed soil samples or the use of density or moisture probes are repaired using the same materials and methods used for repairs on the test fill. CQA personnel shall repair all holes resulting from CQA sampling or testing activities;
- Repaired sections are tied-in with undisturbed sections of the liner;
- Compacted lifts are tied together by scarifying the top of each lift, if necessary, with appropriate equipment prior to applying the following lift;
- Newly placed material is thoroughly kneaded into existing admix at tie-in locations;
- Sufficient liner strength to maintain stable sidewalls and to supply a stable base for supporting overlying materials is maintained while achieving the minimum specified density. This shall be monitored with moisture-density testing in accordance with the procedures listed in Table 4-1. In place field density tests and moisture content tests shall be conducted at a frequency as listed in Table 4-1. Additional tests may be conducted as directed by the CQA Officer. If a nuclear density gauge is used to measure the in-place density of the admix, then at least one rubber balloon, drive cylinder, or sand cone density test shall be conducted per day to confirm the results of the nuclear gauge.

Moisture content measured with the nuclear gauge shall be validated by collecting a minimum of one sample per day for laboratory moisture determination. ASTM D4643 (microwave moisture content) may be used after a reliable correlation between oven dried (ASTM D2216) and microwave results is established;

- Protective covers to prevent desiccation of liner material after completion of the liner are placed in a timely manner where necessary; overbuilding the liner can be considered protective cover; and
- Equipment traffic is routed and controlled such that accidental damage of installed portions of the soil liner is prevented.

Climatic conditions shall be considered when construction methods are chosen. Construction methods may be restricted on work performed during and just after a rainfall, during very hot or windy conditions, or during freezing weather. For example, more compactive effort must sometimes be applied to achieve the same density as soil temperature falls. In very dry weather, the surface water content of each compacted fill layer can be altered in a short time by drying, making continuous watering and blending necessary. Atmospheric conditions shall be observed and recorded by CQA Personnel, and appropriate actions shall be taken when unsuitable weather conditions exist.

At locations where the field testing indicates that moisture contents or densities are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

Shelby tube samples of the in place soil liner shall be obtained at a minimum frequency as listed in Table 4-1 for material placed. The testing frequency shall be increased if the admix material changes significantly. At any time, additional samples may be obtained at the discretion of the CQA Officer or CQA Engineer. At least one sample shall be taken from a corner area. Laboratory Hydraulic Conductivity tests shall be conducted on these samples to document compliance with the specifications.

The CQA Engineer shall monitor on a periodic basis the soil liner surface for desiccation and irregularities to document compliance with the specifications. The completed liner shall be protected from desiccation, erosion, and freezing following completion of the uppermost lift.

4.2.4 Post Construction

Immediately before placement of any geomembrane, the soil liner shall be inspected for cracks, holes, defects, or any other features that may increase its permeability. Defective areas shall be repaired. If the underlying foundation is defective (e.g., soft or wet), then this material shall be removed and the resultant volume replaced. Excavated areas of the soil liner shall be repaired by the method demonstrated during test fill construction; inspection shall document that there is continuity between the repaired and undisturbed areas.

Special attention shall be paid to the final inspections of the sump area, sidewall and bottom slopes, liner coverage, and liner thickness. The CQA Engineer shall coordinate with the CQA Surveyor to confirm that minimum design thicknesses and grades are achieved prior to placement of any additional material over the soil liner.

4.3 GRAVEL DRAINAGE LAYERS

The requirements for the gravel drainage layers are described in 0600X-SP-C0078, Cell Construction, of the Specifications. The CQA Personnel shall perform the following activities:

- Visually observe the material for contamination by debris or deleterious material;
- Visually observe the material for uniformity;
- Sample the material for grain size and permeability tests at a frequency as listed in Table 4-1 for material delivered to the site;
- Observe the placement of the material to confirm minimum thickness under spreading and hauling equipment to prevent damage to the underlying liner materials and components of the leachate collection system; and
- Observe placement and compaction of the material around piping and risers in the sumps.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.3.1 Post-Construction

The CQA Engineer shall coordinate with the CQA Surveyor to document that minimum thicknesses and design grades in the gravel layer have been achieved prior to the placement of any additional materials over the top of the gravel.

4.4 OPERATIONS LAYER

The requirements for the operations layer are described in 0600X-SP-C0078, Cell Construction, of the Specifications. The CQA Personnel shall perform the following activities:

4.4.1 Construction

CQA Personnel shall obtain samples of the proposed operations layer material prior to placement in the landfill. Samples shall be obtained at a frequency as listed in Table 4-1 and tested to document that the material meets the gradation requirements in the specifications. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

During placement of the operations layer material, CQA Personnel shall observe the placement operations on a full-time basis and perform the following:

- Visually observe the material for contamination with debris or deleterious material;
- Visually observe the material for particle size;
- Sample the material for grain size tests at a frequency as listed in Table 4-1 for material placed in the facility;
- Observe the placement of the material to confirm minimum thickness under equipment to prevent damage to the underlying liner materials;
- Visually observe that the operations layer placement on the slopes is conducted in compliance with the procedures outlined in the specifications;
- Visually observe to detect any damage to the underlying liner materials; and
- Visually observe the moisture conditioning, placement, and compaction of the material placed adjacent to the primary slope riser pipes.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.4.2 Post-Construction

The CQA Officer shall coordinate with the CQA Surveyor to confirm that minimum thicknesses and design grades in the operations layer have been achieved prior to the placement of any waste materials.

4.5 ANCHOR, UTILITY, AND SIDE SLOPE RISER PIPE TRENCHES

The requirements for the anchor trenches and side slope riser pipe trenches are described in 0600X-SP-C0075, Sitework, of the Specifications. The CQA Personnel shall perform the following activities:

4.5.1 Construction

CQA Personnel shall obtain samples of the proposed backfill materials for anchor trenches, utility trench and side slope riser pipe trenches prior to backfilling these trenches. Samples shall be obtained at a frequency as listed in Table 4-1 for each material or a minimum of one sample, whichever is greater. Samples shall be tested to confirm that the material meets the gradation requirements in the specifications. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

During placement of backfill in the anchor trenches, utility zone trench and riser pipe trenches, CQA Personnel shall observe the placement operations on a periodic basis and perform the following:

- Visually observe the material for contamination with debris or deleterious material;

- Visually observe the material for particle size;
- Sample the material for grain size tests at the frequency listed in Table 4-1 for material placed;
- Visually observe that the material is moisture conditioned and compacted as specified;
- Visually observe that backfill around riser pipes does not contain voids;
- Observe the placement of the material to document minimum thickness under equipment to prevent damage to the underlying materials; and
- Visually observe to detect any damage to the underlying liner materials.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.5.2 Post-Construction

There are no specific post-construction requirements for anchor trench, utility trench, side slope riser pipe trench backfill.

4.6 HDPE GEOMEMBRANE LINER

The requirements for the HDPE geomembrane liner are described in 0600X-SP-C0077, Cell Construction - Geosynthetics, of the Specifications. The CQA Personnel shall perform the following activities:

4.6.1 Preconstruction

Preconstruction activities for HDPE geomembrane liner include inspection of the raw materials, manufacturing operations, fabrication operations, and final product quality; observations related to transportation, handling, and storage of the membrane; observation of foundation preparation; and review of the personnel qualifications, training, and equipment to be used to install the HDPE geomembrane liner. In addition, CQA Personnel shall perform conformance tests on samples of the HDPE liner material submitted by the geomembrane installer. These activities are discussed in the following subsections. Samples of the geomembrane totaling at least 100 ft² shall be collected by the CQA personnel and archived by the CONTRACTOR.

4.6.1.1 HDPE Manufacture. Quality assurance requirements for the geomembrane manufacturer initially consist of evaluating the raw polymer materials. The resin supplier shall provide documentation with each shipment or production lot confirming that the raw materials comply with the manufacturers' product properties and performance requirements. The Manufacturer shall test each batch (lot) of resin to verify that the raw material meets or exceeds the specifications. The CQA Officer shall submit to the CONTRACTOR an inspection plan for the raw polymer materials in the manufacturer's facilities. The CQA Officer shall inspect the

raw polymer materials only with CONTRACTOR's approval. Any source inspection activities shall be performed in compliance with the surveillance inspection procedures and non-conformances shall be documented and submitted to the CONTRACTOR for disposition and resolution.

CQA Personnel shall review testing results and other documentation submitted by the geomembrane Manufacturer for conformance to the specification requirements. Submittals from the Manufacturer include the following:

- the origin (Resin Supplier's name, resin production plant), identification (brand name, number) and production date of the resin;
- a list of quantities and descriptions of materials other than the base polymer which comprise the geomembrane;
- a copy of the quality control certificates issued by the Resin Supplier;
- reports on the tests conducted by the Manufacturer and the CQA Laboratory to confirm that the quality of the resin used to manufacture the geomembrane satisfies the specifications;
- a statement that no recycled polymer is added to the resin or that recycled polymer is clean and does not exceed 2% by weight, and does not include material that has seen previous service life;
- a properties sheet including properties listed in the specifications, measured using test methods indicated in the specifications, or equivalent;
- reports on the tests, including sampling procedures, conducted by the Manufacturer and/or the CQA Laboratory to confirm that the geomembrane meets the project specifications; and
- a certification that property values given in the properties sheet are guaranteed by the Geomembrane Manufacturer.

4.6.1.2 Receiving Inspection and Conformance Testing. The CQA Personnel shall perform receiving inspection on geomembrane material in compliance with procedures, and nonconformances shall be documented and submitted to the CONTRACTOR for disposition and resolution. CQA Personnel shall also confirm that transportation, handling, and storage of geomembrane are performed in accordance with the specifications and manufacturer's instructions, and shall determine the condition of rolls of geomembrane upon delivery to the site.

CQA Personnel shall remove samples to be tested to determine conformance to the design specifications and the manufacturer's specifications. Samples shall be obtained and tested in accordance with the methods and frequencies listed in Table 4-1. Prior to shipment or after delivery of the rolls of geomembrane, CQA Personnel shall remove samples and forward them to

the geosynthetics testing laboratory. Samples of geomembrane shall be taken across the entire width of the roll and shall not include the first three feet. Unless otherwise specified, samples shall be three feet long by the roll width.

CQA Personnel shall examine results from laboratory conformance testing and shall notify the CONTRACTOR of any such nonconformance. Rolls of geomembrane which do not meet or exceed required specifications shall be rejected and brought to the attention of the CONTRACTOR.

4.6.1.3 Bedding Surface. CQA Personnel shall confirm that the surface upon which the geomembrane will be installed is suitably prepared and will not damage the geomembrane. Details of required observations are presented in the specifications and are summarized in the following paragraphs.

The geomembrane bedding layer shall be free of clods, rocks, sticks, sharp changes in grade, ruts greater than 1 inch, desiccation cracks, and standing water. Where the bedding surface is the low permeability admix liner, methods shall be taken to prevent the soil liner surface from drying and cracking prior to installing the geomembrane. These methods may include the use of a temporary cover. Desiccation cracks larger than the limits listed in the specifications shall be repaired using approved methods as described in the Specifications.

The Geomembrane Installer (Installer) shall inspect and provide written certification to the CONTRACTOR and the CQA Officer that the prepared surface under consideration is suitable for installation of the geomembrane.

After acceptance of the prepared surface, it shall be the Installer's responsibility to notify the CONTRACTOR and the CQA Personnel of any deterioration in the prepared surface resulting from weather or other causes beyond the Installer's control. Repairs required to restore the surface as a result of such causes shall be made as directed by the CONTRACTOR. Any damage to the prepared surface caused by installation or other causes relating to performance of the work shall be the responsibility of the SUBCONTRACTOR.

4.6.2 Construction

Sheets of geomembrane will be welded together after they are placed in the trench to form a continuous moisture barrier. CQA Personnel shall document that the placement and seaming activities are performed in accordance with the specifications; particularly that required materials, methods, and testing procedures are employed. CQA Personnel shall also review documentation submitted by the Geomembrane Installer, testing laboratories, and other parties as listed in the specifications. Seams or repaired areas which do not pass the tests shall be repaired and retested as described in the specifications until a passing result is achieved. Requirements for geomembrane installation and testing are described in detail in the specifications and are summarized in the following subsections.

4.6.2.1 Placement of Geomembranes. Prior to placing geomembranes in the landfill, the Geomembrane Installer shall provide scale drawings showing the proposed placement pattern and field seam locations to the CONTRACTOR and CQA Personnel for review.

Each field panel and field seam shall be given an identification code which is consistent with the proposed sequence of installation. A field panel is defined as the area of geomembrane which is to be cut and seamed in the field by the Installer. Unless otherwise directed, the Installer shall place the field panels in the sequence shown on the installation drawings. CQA Personnel shall verify that the geomembrane is not placed during inclement weather as specified in the Technical Specifications.

Equipment used for placement shall not damage the geomembrane or the subgrade by handling, trafficking, leakage of hydrocarbons, or in other ways. Personnel working on the geomembrane shall not engage in any activities or wear footwear which could damage the geomembrane. Direct contact of any heavy mechanical equipment with the geomembrane shall not be allowed.

Panels shall be carefully unrolled according to the Manufacturer's instructions, and in a manner that does not scratch or crimp the geomembrane. Panels shall be aligned to minimize wrinkles or "fishmouths", especially along the field seams. Adequate precautions (such as placement of sand bags) shall be taken to minimize the likelihood of wind uplift.

Any field panel or part of a field panel which becomes seriously damaged shall be replaced at the direction of the CQA Officer or CONTRACTOR. Minor damage, such as small wrinkles, crimps, etc., shall be repaired using approved procedures as described in the specifications. Damaged field panels which have been rejected for use shall be removed from the site.

4.6.2.1.1 Field Seaming of Geomembrane

Personnel

The Geomembrane Installer shall provide the CONTRACTOR and CQA Officer with a list of the Installer's proposed seaming personnel and their previous seaming experience. Seaming personnel shall be required to pass a seaming test prior to commencement of field seaming operations.

Field Seaming Methods and Equipment

General: Only seaming methods and equipment meeting the specifications shall be used for field seaming of the geomembrane panels.

Where conditions warrant, the Installer may be allowed to use a temporary support surface between the geomembrane and the subgrade to achieve proper support conditions during seaming operations. The use of such support methods shall be subject to the approval of the CQA Officer. The support shall not be left in place and shall be removed on completion of seaming.

Wherever possible, wrinkles or "fishmouths" shall be pulled out of the overlap area prior to seaming. Where this cannot be done, they shall be cut along the ridge of the wrinkle in order to

achieve a flat surface. Such cuts shall be seamed. Where the overlap is inadequate, an oval or round patch of the same geomembrane, extending a minimum of 6 inches beyond the cut in directions, shall be seamed onto the geomembrane.

Extrusion Welding Process: Extrusion welding apparatus shall be equipped with gauges to measure the temperature at the nozzle or the preheat temperature of the apparatus. The CQA Personnel shall monitor the extrudate and ambient temperature at appropriate intervals. The extruder shall be purged of heat-degraded extrudate at the beginning of each seaming sequence.

Artificially induced cooling of extrudate welds (using water or any other means) shall not be allowed. Sufficient time between welding and non-destructive testing shall be taken so that nondestructive testing procedures do not cause artificial cooling of the extrudate.

Fusion Welding Process: Fusion welding apparatus shall be automated, self-propelled devices which produce either a single seam or a double seam with an enclosed central air space. The apparatus shall be equipped with gauges which indicate the equipment temperatures during welding. For the seaming of cross-seams, the top and bottom edges of the cross-seam shall be ground to a smooth incline prior to seaming.

The CQA Personnel shall log ambient and seaming apparatus temperatures, as well as seaming apparatus speed for each seam.

Seam Overlap and Preparation: Prior to seaming, geomembrane rolls or panels shall be overlapped as specified in the Technical Specifications. Procedures used to temporarily bond adjacent rolls together shall not result in damage to the geomembrane. If mechanical devices such as hot air leisters are used for temporary bonding, the air temperature at the nozzle of such equipment shall be controlled so as not to damage the geomembrane. Solvents or adhesives shall not be used.

Seams shall be aligned to create as smooth a surface as practicable with a minimum of wrinkles and "fishmouths". The area in the immediate vicinity of the seam shall be free of moisture, dust, dirt, debris, or any other foreign material and, if necessary, sheltered from wind and dust immediately prior to and during the seaming operation. If grinding is required along the seam, this shall be done according to the Manufacturer's recommendations, within one hour of the seaming operation and in a way which does not damage the geomembrane. This process also shall include cleaning the seam area with a brush or forced air immediately prior to seaming. Particular care shall be paid to the condition of existing geomembrane prior to tie-in with new geomembrane.

The CQA Personnel shall document geomembrane seam overlaps and preparation procedures.

Weather Conditions

Seaming shall not be attempted in inclement weather as specified in the Technical Specifications.

Trial Seams

Trial seams shall be made and tested to verify that adequate conditions exist for field seaming to proceed. Each seamer shall produce a trial seam at the beginning of each shift. Additional trial seams shall be made and tested as specified in the Technical Specifications. This frequency may change at the discretion of the CQA Officer with approval of the CONTRACTOR. The CQA Personnel shall monitor and log the trial seam results.

4.6.2.1.2 Nondestructive Testing of Field Seams

General

Seams shall be nondestructively tested by the Installer over their full length to verify their continuity. It should be noted that this testing does not provide any information regarding seam strength. Nondestructive testing shall be performed concurrently with field seaming using the equipment and procedures described below. Testing equipment and procedures other than those given below shall be subject to approval by the CONTRACTOR prior to their use. Any seam which fails the nondestructive test shall be repaired in accordance with approved procedures as described in the Specifications. Repairs shall be retested to determine the success of the repair.

Where CQA Personnel determine that seams cannot be nondestructively tested due to physical constraints, the seams shall be capped with the same geomembrane or double seamed. CQA Personnel shall observe the seaming and capping of such seams to assess their adequacy and determine whether additional action is required. Where such a seam is accessible for testing prior to final geomembrane deployment, testing shall be performed prior to deployment.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

Vacuum Testing

For extrusion and single wedge fusion welded seams, seams shall be evaluated using vacuum box testing as specified in the Technical Specifications. The vacuum box shall consist of a rigid housing with a transparent viewing window on top and a soft, flexible gasket attached to the bottom of the housing. A port hole and valve assembly along with a calibrated vacuum gauge shall be provided at one end of the housing. The vacuum gauge shall be calibrated prior to initial use on the project and recalibrated on at least an annual basis, at the end of the project, or at the discretion of the CQA Officer. The Installer shall supply vacuum gauge calibrations to the CQA Officer for review prior to the start of testing. A steel vacuum tank and pump assembly complete with the necessary pressure controls, pipe connections, pressure hoses, and fittings shall be provided. A soapy solution and a method of dispensing the solution are also required.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

Air Pressure Testing

This test method (ASTM D5820) shall apply only when the double hot wedge fusion seaming method is used to form the seam. The testing equipment shall consist of an air pump capable of generating and sustaining pressure of at least 40psi complete with a pressure gauge and the necessary pressure hose, fittings, and connections. An approved pressure feed device such as a

sharp hollow needle shall be provided to penetrate into the central air channel at one end of the seam. A second calibrated pressure gauge in 1psi increments capable of reading pressures up to 40 psi shall be provided to detect any pressure loss at the opposite end of the seam from the pressure feed device. The pressure gauges shall be calibrated prior to initial use on the project and recalibrated on at least an annual basis, at the projects end or at the discretion of the CQA Officer. The Installer shall supply pressure gauge calibrations to the CQA Officer for review prior to the start of testing. The test shall be performed as specified in the Technical Specifications.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

4.6.2.2 Destructive Testing of Field Seams. Destructive testing of field seams shall be performed at selected locations in order to verify that seams satisfy the strength requirements listed in the specifications. Sampling and testing shall be done concurrently with field seaming operations so that corrective action, if required, may be implemented as the work progresses. Samples shall be taken for testing so as to achieve a minimum average daily frequency as listed in Table 4-2. Sample locations shall be determined by CQA Personnel based on the required sampling frequency and seaming observations. The Installer shall not be informed in advance of the locations where the seam samples will be taken. Additional test locations may be required during seaming operations such as along tie-in seams with existing geomembranes. The necessity for such additional sampling and testing shall be determined by CQA Personnel, and extra testing shall be performed when there is cause to suspect the presence of excess crystallinity, contamination, offset welds, or any other potential defect. The CQA Officer may increase the minimum frequency of destructive testing as the work progresses based on the results of previous testing.

Samples shall be cut by the Installer under the observation of CQA Personnel. Samples may be cut prior to nondestructive seam testing. Each sample shall be numbered and identified. The sample number and location shall be recorded by CQA Personnel on the layout drawings.

The test sample shall measure approximately 12 inches wide by 42 inches long with the seam centered lengthwise. The sample shall be cut into three equal parts having a minimum length of 12 inches. One sample shall be taken by CQA Personnel for destructive testing under laboratory conditions. One sample shall be given to the Installer to perform CQC testing. The third sample shall be kept in storage by the CONTRACTOR.

The area from which the test sample was cut shall be immediately repaired in accordance with approved procedures described in the Specifications. Seams created for these repairs shall be nondestructively tested in accordance with Section 4.6.2.1.2.

Neither of the field tests shall fail in the seams. The results of the laboratory testing by CQA Personnel shall in any case determine the acceptability of the field seam. The tests shall be performed in accordance with the methods listed in Table 4-2.

Passing values for field testing are defined in specification 0600X-SP-C0077. Field testing shall meet these values for each test otherwise the seam will be considered failing.

A field seam shall only be considered acceptable when it is bounded by two destructive test locations which meet the seam strength requirements listed in the specifications, as well as passing the nondestructive tests described in Section 4.6.2.1.2. Whenever a sample fails a destructive test the Installer shall repair the failed seam as specified in the Technical Specifications.

The continuity of capped seams shall be verified by nondestructive testing in accordance with Section 4.6.2.1.2. In addition, if the total capped seam length exceeds 150 feet, a destructive sample shall be taken for laboratory testing as described above.

The CQA Personnel shall document actions taken in conjunction with destructive test failures.

4.6.2.3 Repairs. The entire geomembrane surface shall be examined by CQA Personnel in order to confirm that the geomembrane is free of any defects, holes, blisters, undispersed raw materials, or contamination by foreign matter. Particular attention shall be paid to existing geomembrane in tie-in areas. Whenever possible, the examination of the geomembrane surface shall be done prior to any seaming in that area. If necessary, the geomembrane surface shall be cleaned by the Installer so that it is free of dust, mud, or any other materials which may inhibit a thorough examination of the surface. Any suspect areas shall be clearly marked by CQA Personnel and nondestructively tested by the Installer in accordance with Section 4.6.2.1.2. Any location which fails to pass the nondestructive testing or from where a destructive test sample has been removed shall be repaired using one of the procedures described below.

Small tears, wrinkles, scratches, or pinholes shall be repaired by the Installer using spot welding, seaming, or patching, as appropriate. Large holes and tears, undispersed raw materials, and any areas which have been contaminated by foreign matter shall be repaired by the Installer as specified in the Technical Specifications.

Repairs shall be nondestructively tested using the appropriate methods described in Section 4.6.2.1.2. Unless additional destructive testing is required as described in Section 4.6.2.2, repairs which pass the nondestructive test shall be accepted as being adequate. Any repairs which fail the nondestructive test shall not be accepted, and the Installer shall perform the necessary remedial work and retest the repaired area until it passes the nondestructive testing criteria.

Upon completion of field seaming and testing, and prior to any placement of materials on top of the geomembrane, CQA Personnel shall identify any large wrinkles or "fishmouths" which may have been built into the geomembrane. Any such features shall be cut out, repaired, and tested by the Installer.

In any given area, no work shall proceed with any materials which may cover the geomembrane until repairs in that area have been successfully made. As the work progresses, CQA Personnel shall document locations requiring repair work and shall confirm that repairs have been successfully made.

Materials in Contact with Geomembrane. Equipment used for placing and compacting overlying soil materials shall not be driven directly on to any geosynthetic material. The minimum thickness of material maintained between the geomembrane and the equipment shall be as specified in the Technical Specifications. Equipment shall be observed by the CQA Personnel during placement to document that no leakage of hydrocarbons occurs, particularly on top of the geomembrane.

Placement of soil materials on top of the geomembrane shall not be allowed within 50 feet of any unseamed edge of geomembrane until field seaming of that edge is complete. This is required to allow sufficient room to work out any large wrinkles or "fishmouths" prior to seaming.

The placement of cover materials shall be done with caution and in a manner which is least likely to cause wrinkles in, or damage to, the geomembrane. The CQA Personnel shall monitor the placement of cover materials over the geomembrane on a regular basis.

4.6.3 Post-Construction

Site Clean-up

Upon completion of work in any given area, CQA Personnel shall examine that area to determine whether waste and extraneous materials have been removed and that the area has been left in a satisfactorily clean condition to allow placement of materials on top of the geomembrane.

Completion of Work

The installation of the geomembrane shall be considered as complete when: (1) required deployment, field seaming, testing, repairs, retesting, and site clean-up have been completed by the Installer and approved by CQA Personnel; (2) the Installer has submitted the required quality control certificates and work/inspection records to the CONTRACTOR; and (3) the CQA Subcontractor is satisfied that the geomembrane has been installed in accordance with the plans and specifications.

4.7 LEACHATE COLLECTION SYSTEM (LCS)

The requirements for the leachate collection system (LCS), leachate transmission system, and leachate storage tanks are described in the following sections of the Specifications (most current revisions):

<u>Section Title</u>	<u>New Section No.</u>
Geosynthetics	0600X-SP-C0077
Leachate Collection System	0600X-SP-C0078
Crest Pad Building	0600X-SP-C0080
Leachate Tank	0600X-SP-C0082
Pipe, Valves, and Specials	0600X-SP-M0032
Leachate Pumps	0600X-SP-M0033
Crest Pad Piping	0600X-SP-M0032
Crest Pad Valves	0600X-SP-M0032

Meters, General	0600X-SP-M0032
Electrical Distribution System, Underground	0600X-SP-E0025
Electrical Work, Interior	0600X-SP-E0025

The CQA Personnel shall perform the following activities:

4.7.1 Pre-Construction

CQA Personnel shall inspect leachate collection, transmission, and storage system materials, equipment, and components when they are delivered to the site to confirm that they conform to the design criteria and specifications. Receiving inspection shall be performed in compliance with the procedures specified in the CQAP and CQA Subcontractor's QAP. Non-conformances shall be documented and submitted to the CONTRACTOR for disposition and resolution. In general, activities performed by CQA Personnel shall include the following:

- Inspect materials upon arrival at the site to confirm conformance to the specifications;
- Inspect piping components to confirm (from appearance and shipping documents) that they are constructed of materials as listed in the plans, specifications, and procurement documents and that they are not damaged. Take measurements to confirm that pipe is of specified size and wall thickness and that perforations are sized and spaced as specified;
- Observe and test to confirm that sand and gravel materials conform to the specifications, are of the proper size and gradation, and do not contain unacceptable types of materials. Testing requirements for the drainage layers are outlined in Section 4.3;
- Inspect to confirm that prefabricated structures (tanks, manholes, etc.) are as specified in the design. Such items include, but are not limited to, non-HDPE piping systems, prefabricated HDPE components, electrical equipment, and monitoring equipment. Inspection shall include visual observation of any corrosion-resistant coatings to document that they are present and without flaw. The CONTRACTOR shall be informed of the acceptance status of all such items prior to installation; and
- Witness, inspect and document LCS equipment, system components, and mechanical/electrical equipment to confirm they meet specification requirements. Acceptance Tests (AT) shall be performed by the Construction SUBCONTRACTOR and observed by CQA Personnel.

4.7.2 Construction

4.7.2.1 Pipe Network Installation. The HDPE pipe network shall be placed according to Technical Specifications and Drawings. CQA monitoring activities shall include:

- Review of construction subcontractor's submittals concerning joining methods and type of perforations;

- Review of manufacturer's certification to document that the HDPE pipe meets the specifications;
- Visually observe that the geonet and geotextile layers are placed over the geomembrane prior to pipe installation;
- Observe and measure to confirm that the pipes are placed at specified locations and in specified configurations, and that pipe grades are as specified;
- Verify that the internal cleanliness of HDPE pipe is maintained;
- Visually observe that pipes are joined together and perforated in accordance with the approved procedures. Visual inspection of the carrier pipe is not required when double containment pipe is joined using the double butt fusion process (the pipes will be pressure tested);
- Observe that the placement of any filter or backfill materials around the pipe proceeds as shown on the plans;
- Witness, review, and document testing of HDPE piping prior to being buried or covered with liner; and
- Observe that backfilling and compaction are completed as specified and that, in the process, the pipe network is not damaged.

4.7.2.2 Drainage Layer. Inspection of the drainage layer shall include:

- Testing the material to confirm that it has the specified particle size and is free from excessive amounts of fines or organic materials (See Section 4.3);
- Measuring the thickness and observing coverage of each drainage layer as it is placed in the LCS (coordinate with CQA Surveyor); and
- Surveying the completed layer to document that specified slopes and grades are obtained (coordinate with CQA Surveyor).
- Placement of the drainage layers shall not damage any component of the underlying composite liner or the piping.

4.7.2.3 Geosynthetics

Manufacture

The geosynthetics manufacturers shall provide a list of guaranteed properties for the type of geosynthetics to be delivered. The manufacturers shall also provide written certification signed by a responsible party that the materials actually delivered have properties which meet or exceed the guaranteed values.

Rolls of geosynthetics shall be marked or tagged with the following information:

- manufacturer's name,
- product identification,
- lot number,
- roll number, and
- roll dimensions.

If any special handling of the materials is required, it shall be so marked, e.g., "This Side Up" or "This Side Against Geonet".

Shipment, Handling, and Storage

The geotextile and geocomposite material shall be protected from ultraviolet light exposure, precipitation or inundation by water, mud, dirt, dust, puncture, cutting, and any other damaging or deleterious conditions as specified in the Technical Specifications. CQA Personnel shall document that geonets are free of dirt and dust just before installation. If the geonets are judged dirty or dusty, they shall be washed by the Installer prior to installation.

Conformance Testing

Geosynthetics samples shall be obtained and tested in accordance with the phase, test methods, and frequencies listed in Table 4-2. CQA Personnel shall remove samples and forward them to an approved geosynthetic laboratory for testing to document conformance to both the design specifications and the list of guaranteed properties. Samples shall be taken across the entire width of the roll and shall not include the first 0.9 meter (three feet). Unless otherwise specified, samples shall be 0.9 meter (three feet) long by the roll width. The machine direction shall be marked on the samples with an arrow.

CQA Personnel shall examine all results from laboratory conformance testing and shall report any nonconformance to the CQA Officer and the CONTRACTOR.

Installation

The geosynthetics Installer shall handle geosynthetics in such a manner that they are not damaged. On slopes, the geocomposite material shall be securely anchored in the anchor trench and then rolled down the slope in such a manner as to continually keep the geocomposite sheet in tension. In the presence of wind, geotextiles, geocomposites, and geonets shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during placement and shall remain until replaced with earth cover material. Geotextiles, geonets, and geocomposites shall be cut using approved cutters only. Special care shall be taken to protect other materials from damage which could be caused by the cutting of the geotextile, geocomposite, and geonet materials. The Installer shall take any necessary precautions to prevent damage to underlying layers during

placement of the geotextile, geocomposites, or the geonet. During placement of geotextile and geocomposite materials, care shall be taken not to entrap stones, sandbags, excessive dust, or moisture that could damage the geosynthetic material, clog drains or filters, or that might hamper subsequent seaming. Geotextiles and geocomposites shall not be dragged across textured geomembranes.

CQA Personnel shall visually examine the entire surface of the geotextile and geocomposite layers after installation to confirm that no potentially harmful foreign objects, such as needles, are present. In addition, the CQA Personnel may undertake a sweep of the entire geotextile surface using a metal detector, to determine the presence of any such items.

During placement of geonets, care shall be taken not to entrap dirt or excessive dust that could cause clogging of the drainage system, and stones that could damage the adjacent geomembrane. If dirt or excessive dust is entrapped in the geonet, it shall be hosed clean prior to placement of the next material on top of it. In this regard, care should be taken with the handling of sandbags, to prevent rupture or damage. Care shall be taken not to leave tools in the geonet. CQA personnel shall confirm that all geonet is covered with geotextile on the same day it is deployed.

Seams

Geosynthetics shall be seamed as specified in the Technical Specifications.

CQA Personnel shall visually examine geosynthetics seams to document that the specified requirements have been met.

Repair

Holes or tears in the geosynthetics shall be repaired as specified in the Technical Specifications.

CQA Personnel shall visually observe and document geosynthetics repair procedures.

Soil Placement

Soil shall not be placed in direct contact with geonets.

The Installer shall place soil materials on top of geotextiles or geocomposites in such a manner that there is:

- no damage to the geotextile, geocomposite, or underlying layers;
- minimal slippage of the geotextile or geocomposite on the underlying layers; and
- no excess tensile stresses in the geotextile or geocomposite.

CQA Personnel shall visually observe that the above conditions are satisfied.

4.7.2.4 Leachate Collection, Transmission, and Storage System Equipment and Components

Electrical System and Pump Controls

The electrical system which controls the leachate pumps shall be checked for proper installation and operation. The SUBCONTRACTOR's CQC activities are described in the pertinent sections of the specifications. CQA Personnel shall perform the following activities:

- Receipt inspections of electrical components (verify UL, listings, etc.);
- Review construction subcontractor's submittals and proposed equipment to document compliance with the specifications;
- Verify and document final tagging, labeling, and marking of the electrical systems (i.e. breaker, outlets, disconnects, switches, etc.); and
- Perform or review component checks of resistance, grounding, and load prior to complete system check.

Pumps, Piping, Meters, and Valves

The pumps, piping, instruments (such as the flow meters), and valves that are included in the leachate collection (removal and transfer) system shall be examined and tested at the system level for conformance to the specifications and proper performance. CQA Personnel shall perform the following activities in conjunction with these items:

- Review construction subcontractor's submittals and equipment deliveries to the site to verify conformance with the specifications;
- Review the results of subcontractor's acceptance testing of the piping system;
- Verify and document final tagging, labeling, and marking of the electrical systems (i.e. breaker, outlets, disconnects, switches, etc.);
- Review system performance checks to confirm operation in accordance with the specifications; and
- Review the complete leachate removal system performance using the installed pumps as described in the specifications.

Leachate Storage Tank System

The leachate storage tank, cover, piping, instruments (such as the level measurement), and valves shall be examined and tested at the system level for conformance to the specifications and proper performance. CQA Personnel shall perform the following activities in conjunction with these items:

- Review construction subcontractor's submittals and equipment deliveries to the site to verify conformance with the specifications;
- Oversight of subgrade and foundation preparation; placement and compaction of backfill; placement of reinforcing steel and anchor bolts; concrete placement; placement of shop-fabricated tank parts; erection of field-erection tank parts; installation of piping, pumping, and other ancillary equipment to verify conformance with the specifications;
- Oversight of installation and testing of tank liner systems to verify conformance with the specifications;
- Review the results of subcontractor's acceptance testing of the system;
- Verify and document final tagging, labeling, and marking of the systems (i.e. breaker, outlets, disconnects, switches, etc.);
- Review system performance checks to confirm operation in accordance with the specifications; and
- Review the complete leachate removal system performance using the installed pumps as described in the specifications.

Acceptance Test Plan

CQA Personnel will observe and record the results of the Acceptance Tests. The acceptance tests will be performed by the SUBCONTRACTOR to demonstrate that the installed pumps, piping, leachate storage tank, instrumentation, and electrical system components function as intended by the design.

4.7.3 Post-Construction

The post-construction inspection of the LCS shall include observations to confirm that systems and components have been installed in the proper locations and according to the design drawings, Construction Specifications, and Manufacturer's specifications.

5.0 DOCUMENTATION

This section describes the documentation required during construction of ERDF Cells 9 & 10.

5.1 DAILY REPORTS

Daily reports shall be completed by CQA Personnel when they are on site. CQA Personnel shall be assigned field books which will be labeled with a unique number issued by the CQA Officer. The field CQA Personnel shall record field observations and the results of field tests either in their assigned field book or on standard field data sheets. After each book is filled and at the end

of the project, the field books shall be returned to the CQA Officer or CQA Engineer and routed to the project files. CQA Officer or CQA Engineer shall keep a log of field logbooks issued, returned, and completed. Log books shall be completed and maintained in accordance with CONTRACTOR's expectations.

Each page of the field book shall be numbered, dated, and initialed by CQA Personnel. At the start of a new work shift, CQA Personnel shall list the following information at the top of the page:

- Job Name
- Job Number
- Date
- Name
- Weather conditions
- Page number (if pages are not pre-numbered)

The remaining individual entries shall be prefaced by an indication of the time at which they occurred. If the results of test data are being recorded on separate sheets, it shall be noted in the field book.

Entries in the field book shall include but not be limited to the following information:

- Reports on any meetings held and their results;
- Equipment and personnel being used in each location, including subcontractors;
- Descriptions of areas being observed, inspected, and documented;
- Description of materials delivered to the site, including any quality verification (vendor certification) documentation;
- Descriptions of materials incorporated into construction;
- Calibrations, or recalibrations, of test equipment, including actions taken as a result of recalibration;
- Decisions made regarding use of material and/or corrective actions to be taken in instances of substandard quality; and

- Unique identifying sheet numbers of inspection data sheets and/or problem reporting and corrective measures reports used to substantiate the decisions described in the preceding item.

The daily report shall include information of the day's work activities, tests and observations that were made, descriptions of the adequacy of the work performed, and highlight any unresolved issues that must be addressed by the CQA Officer or CQA Personnel the following day. In addition, the daily report shall reference the field book number and page numbers that cover that day's activities. The daily reports shall be submitted to the CONTRACTOR.

The CQA Engineer shall review and initial each daily report before distributing to the project quality records and the CONTRACTOR.

5.2 INSPECTION DATA SHEETS

Observations, results of field and laboratory tests performed on site or off site shall be recorded on an inspection data sheet. At a minimum, each inspection data sheet shall include the following information:

- Unique identifying sheet number for cross-referencing and document control;
- Description of the inspection activity;
- Location of the inspection activity and location from which the sample was obtained;
- Type of inspection activity and/or procedure used (reference to standard method when appropriate);
- Recorded observation or test data, together with necessary calculations;
- Results of the inspection activity (e.g. pass/fail) and comparison with specification requirements;
- Identification of personnel involved in the inspection activity; and
- Signature of the CQA Personnel performing the activity and concurrence by the CQA Officer or CQA Engineer.

5.3 NONCONFORMANCE REPORTING

A nonconformance is considered to be a deficiency in characteristics, documentation, or procedures that renders the quality of an item or activity unacceptable or indeterminate. If a deficiency cannot be repaired or replaced to the satisfaction of CQA Personnel within the guidelines established by this CQAP, then such a deficiency shall be considered a nonconformance and shall be documented in accordance with the CQA Subcontractor's NCR procedure. Nonconforming situations shall be brought to the attention of the CQA Officer and

the CONTRACTOR for concurrence prior to initiation of the NCR. These individuals and others as directed by the CONTRACTOR shall participate in NCR disposition, resolution, and corrective action processes. Documentation relating to NCR situations shall be retained in the project quality.

5.4 DESIGN CHANGES AND CLARIFICATIONS

Requests for changes to the specifications or drawings shall be completed on form(s) provided by the CONTRACTOR. Design changes shall be approved by the CONTRACTOR prior to implementation.

Requests for modifications to the CQAP shall be made by memorandum to the CONTRACTOR with copies to the CQA Officer.

Construction questions or clarifications regarding interpretation of the plans and/or specifications shall be submitted to the CONTRACTOR on forms provided by the CONTRACTOR.

5.5 PROGRESS REPORTS

The CQA Officer shall prepare a summary progress report each week, or at time intervals established at the pre-construction meeting. As a minimum, this report shall include the following information:

- A unique identifying sheet number for cross-referencing and document control;
- The date, project name, location, and other information;
- A summary of work activities accomplished during progress reporting period;
- Identification of areas or items inspected and/or tested during the reporting period that are addressed by the report;
- A summary of the quality characteristics being evaluated, with appropriate cross-references to specifications and/or drawings;
- A summary of inspection and test results, failures, and retests;
- A summary of construction situations, deficiencies, and/or defects occurring during progress reporting period;
- A summary of other problem resolutions and dispositions; and
- The signature of the CQA Officer.

5.6 FINAL DOCUMENTATION

Daily inspection summary reports, field logbooks, inspection sheets, data sheets, problem identification and corrective measures reports, acceptance reports, deviations from design and material specifications (with justifying documentation), DCNs, photographic records, progress reports, drawings, drawing revisions, and other documentation shall be retained as permanent project quality records in compliance with the CQA Subcontractor's QAP. At the completion of the project, a final summary report that incorporates the above information, along with as-built drawings, shall be prepared by the CQA Officer and submitted to the CONTRACTOR. The as-built drawings, which will be generated by a licensed land surveyor licensed in the State of Washington and retained by the SUBCONTRACTOR, shall include scale drawings depicting depths, plan dimensions, elevations, and fill thicknesses. The report shall include documentation of each construction component monitored by CQA Personnel and shall certify that the facility was constructed in accordance with the CQAP, Technical Specifications, and Drawings. The report shall be sealed by a professional engineer registered in the State of Washington.

5.7 STORAGE OF RECORDS

During the construction of ERDF cells, the CQA Officer shall be responsible for CQA documents. This includes the CQA Officer's copy of the design criteria, plans, procedures, and specifications; the CQAP; and the originals of the data sheets and reports. Completed documents shall be routed to the project quality records in compliance with those sections of the CQA Subcontractor's QAP which address project QA records management, including maintenance of a records index, access control, and duplicate records requirements. Working copies shall be retained at the field office to the extent necessary to properly support ongoing activities. Records shall be submitted to the CONTRACTOR in accordance with Exhibit I.

6.0 REFERENCES

ASTM, 2009, *2009 Annual Book of ASTM Standards*, American Society for Testing and Materials, Philadelphia, Pennsylvania

Volume 4.08: Soil and Rock:

- CI36 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- D422 Standard Test Method for Particle-Size Analysis of Soils
- D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³)
- D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
- D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique

- D1556 Standard Test Method for Density & Unit Weight of Soil in Place by the Sand-Cone Method
- D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-mm³)
- D1603 Standard Test Method for Carbon Black Content in Olefin Plastics
- D1777 Standard Test Method for Thickness of Textile Materials
- D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
- D2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- D2434 Test Method for Permeability of Granular Soils (Constant Head)
- D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D2937 Standard Test Method for Density of Soil in Place by the Drive Cylinder Method
- D4218 Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
- D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- D4643 Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Heating
- D4716 Standard Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
- D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
- D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

- D5084 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
- D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
- D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles
- D5321 Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
- D5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
- D5641 Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
- D5820 Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
- D5994 Standard Test Method for Measuring Core Thickness of Textured Geomembrane
- D6391 Standard Test Method for Field Measurement of Hydraulic Conductivity Limits of Porous Materials Using Two Stages of Infiltration from a Borehole
- D6392 Standard Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Method
- D6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
- D6938 Standard Test Method for In-Place Density and Water Content of Soil-Aggregate by Nuclear Methods (Shallow Depth)
- D7005 Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
- D7466 Standard Test Method for Measuring the Asperity Height of Textured Geomembrane
- Ecology, 1994, *Dangerous Waste Regulations*, WAC 173-303, Washington State Department of Ecology, Olympia, Washington
- EPA/600/R-93/182 Quality Assurance and Quality Control for Waste Containment Facilities, 2nd Edition, Waste Containment Facilities, ASCE Press, 2007
- EPA, 1994, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, 40 CFR 264, U.S. Environmental Protection Agency, Washington, D.C.

WCH-51, *River Corridor Closure Contract Quality Assurance Program Description*,
Washington Closure Hanford, LLC, Richland, Washington

TABLES

**TABLE 4-1. SOIL MINIMUM TESTING REQUIREMENTS
4-1.1 EARTHWORK**

Phase	Material	Test and ASTM Number	Frequency
Pre-construction	Backfill	Grain Size Distribution (C136/D422) ⁽¹⁾	1 per 8,000 yd ³
		Atterberg Limits (D4318)	1 per 8,000 yd ³ for soil with > 12% passing the No. 200 sieve
		Modified Proctor Compaction (D1557)	1 per 8,000 yd ³
Construction	Waste Trench Subgrade ⁽²⁾	In-Place Density (D6938)	1 per 10,000 ft ²
	Structural Fill & Waste Trench Embankment ⁽²⁾	In-Place Density (D6938)	1 per 10,000 ft ² per lift
	Below Crest Pad Bldgs ⁽²⁾	In-Place Density (D6938)	2 per lift
	Utility Trench	In-Place Density (D6938)	1 per 300 ft of trench

Notes:

- (1) ASTM C136 shall be used when the amount of material passing the No. 200 sieve is less than 12% by weight. ASTM D422 shall be used when the fine soil fraction is greater than this value
- (2) If ASTM D6938 is used at least one ASTM D1556, ASTM D2937, or ASTM D2167, as well as one ASTM D2216 or ASTM D4643 shall be performed per shift.

4-1.2 ADMIX SOIL LINER

Phase	Material	Test and ASTM Number	Frequency
Pre-construction	Bentonite	Manufacturer's Certificates	1 per 500 tons delivered
	Admix	Recompacted Hydraulic Conductivity (D5084)	1 per 20,000 yd ³
		Standard Proctor (D698)	1 per 20,000 yd ³
		Atterberg Limits (D4318)	1 per 5,000 yd ³
		Natural Moisture Content (D2216)	1 per 1,000 yd ³
		Maximum Clod Size	Periodic Visual Monitoring
		Belt Scale Measurements	1 per 5,000 yd ³
	Base Soil	Particle Size Distribution/Hydrometer (D422)	1 per 10,000 yd ³
USCS Classification (D2487)		1 per 10,000 yd ³	
Test Fill	Admix	Visual Observation	Continuous
		In-Place Moisture-Density (Nuclear, D6938)	6 per lift
		In-Place Moisture-Density (Rubber Balloon, D2167), (Drive Cylinder, D2937) or (Sand Cone, D1556)	1 per lift
		Moisture Content (D2216 or D4643)	1 per day if nuclear gauge is used
		Hydraulic Conductivity (D5084)	1 per lift
		Boutwell (ASTM D6391)	1 per test fill
Construction	Admix	Visual Observations	Continuous
		In-Place Moisture-Density (Nuclear, D6938)	5/acre/lift
		In-Place Moisture-Density (Rubber Balloon, D2167), (Drive Cylinder, D2937) or (Sand Cone, D1556)	1 per day, if nuclear gage is used.
		Shelby Tube for Permeability (D5084)	1 per 5,000 yd ³ , and at least 1 in a corner area
		Moisture Content (D2216 or D4643)	1 per day if nuclear gauge is used

4-1.3. GRAVEL DRAINAGE LAYERS

Phase	Material	Test and ASTM Number	Frequency
Construction	Gravel	Visual Observations	Continuous
		Standard Proctor (ASTM D698) ⁽¹⁾	1 per 10,000 yd ³
		Grain Size Distribution (C136)	1 per 2,000 yd ³
		Permeability (D2434)	1 per 2,000 yd ³
		In-Place Density (ASTM D6938) ⁽¹⁾	1 per 10,000 yd ³

(1) Type C material only.

4-1.4 OPERATIONS LAYER

Phase	Material	Test and ASTM Number	Frequency
Construction		Visual Observations	Continuous
		Standard Proctor (ASTM D698)	1 per 10,000 yd ³
		Grain Size Distribution (D422)	1 per 2,000 yd ³
		In-Place Density (D6938)	1 per 20,000 ft ²

4-1.5 ANCHOR TRENCH/SIDE SLOPE RISER PIPE TRENCH

Phase	Material	Test and ASTM Number	Frequency
Construction	Backfill	Visual Observations	Periodic
		In-Place Density (D6938)	1 per 300 ft of trench
		Grain Size Distribution (D422)	1 per 2,000 yd ³

TABLE 4-2. GEOSYNTHETIC MATERIALS MINIMUM TESTING REQUIREMENTS
4-2.1. HDPE GEOMEMBRANE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Resin	Manufacturer's Documentation Certification and QC Test Results	Every Lot
	Geomembrane	Manufacturing Plant Visit	During Production
		Manufacturer's Documentation, Certification and QC Test Results	Every Roll
Pre-Construction (Before Installing) (Note 1)	Geomembrane	Receiving Inspection	Every Roll
		Specific Gravity (D1505) Carbon Black Content (D1603 or D4218) Asperity Height (D7466) Tear (ASTM D1004) Carbon Black Dispersion (D5596) Thickness (D5199 or D5994) Yield Strength (D6693) Elongation at Yield (D6693) Break Strength (D6693) Elongation at Break (D6693) Puncture Resistance (D4833)	Every 50,000 ft ² per Lot
		Friction Angle (Direct Shear – D5321) admix vs geomembrane	2 Tests Total
		Extrudate	Documentation and Certification
	Installation Surface	Installer's Certification of a Suitable Installation Surface	Each Installation Surface
Construction	Geomembrane	Seam Overlap	Every Panel
		Trial Seams	2 times/day per Welder per Machine
		Vacuum Test (D5641)	All Extrusion or Single Wedge Fusion Welds
		Air Pressure Test (D5820)	All Double Wedge Fusion Welds
		Seam Destructive Test (D6392) (5 peel/5 shear)	Min. Avg. of 1 per 500 ft per Welder

Notes:

1. Testing may be performed prior to shipment from factory.

4-2.2 GEOTEXTILE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geotextile and Thread	Manufacturer's Documentation, Certification, and QC Test Results	Every 50,000 ft ² per Lot
Pre-Construction (Before Installing) (Note 1)	Geotextile	Receiving Inspection	Every Roll
		Mass per Unit Area (D5261) Grab Strength (D4632) Tear Strength (D4533) Puncture Strength (D4833) Thickness (D1777 or D5199) Filter Application Only Permittivity (D4491), Type A only Apparent Opening Size – AOS (D4751), Type A only	Every 50,000 ft ² per Lot

Notes:

1. Testing may be performed prior to shipment from factory

4-2.3. GEOCOMPOSITE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (After Bonding, but Before Shipping)	Geonet and Geotextile Components	Manufacturer's Documentation, Certification and QC Tests	Every 50,000 ft ² per Lot
		Passing Conformance Test Results for both the Geonet and the Geotextile	
	Geocomposite	Manufacturer's Documentation, Certification and QC Test Results	
Pre-Construction (Note 1)	Geocomposite	Receiving Inspection	Every Roll
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Textured HDPE Liner	2 Tests Total
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Operations Layer	2 Tests Total
		Ply Adhesion (ASTM D7005) Transmissivity (ASTM 4716)	Every 50,000 ft ² per Lot

Notes:

1. Testing may be performed prior to shipment from factory

4-2.4 GEONET

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geonet	Manufacturer's Documentation Certification and QC Tests	Every 50,000 ft ² per Lot
Pre-Construction (Before Installing) (Note 1)	Geonet	Receiving Inspection	Every Roll
		Polymer Specific Gravity (D1505) Thickness (D1777 or D5199) Mass per Unit Area (D5261)	Every 50,000 ft ² per Lot
Notes:			
1. Testing may be performed prior to shipment from factory.			

TABLE 4-3. ERDF CONSTRUCTION HOLD POINTS

Phase	Activity	Hold Point	Needed to Proceed
Excavation	Subgrade for Liner	Before Covering Subject Portion with Next Layer	Passing CQA density tests
			CQA subgrade survey completed
Soil Liner	Admix Placement	Before Placing in Cell	Passing CQA tests for test fill and stockpiled admix
	Final Surface	Before Covering with HDPE Liner	Passing CQA tests and observation requirements CQA surveys to verify final soil liner thickness
HDPE Liner	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
			Acceptable SUBCONTRACTOR and CQA Friction Angle tests
		Before Covering Subject Portion with Next Layer	CQA review of SUBCONTRACTOR's installation records
			Passing CQA tests.
	CQA visual inspection of panels, seams, penetrations, and repairs		
CQA surveys of seams, penetrations, and repairs			
Geotextile	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
		Before covering subject Portion with Next Layer	CQA visual inspection of panels, seams, penetrations, and repairs
Geocomposite	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
			Acceptable SUBCONTRACTOR and CQA Friction Angle tests
		Before Covering Subject Portion with Next Layer	CQA visual inspection of panels, seams, penetrations, and repairs
Drainage Gravel	Installation	Before Covering subject Portion with Next Layer	Passing CQA tests
			CQA surveys to verify layer thickness
Operations Layer	Installation	After Installing	Passing CQA tests
			CQA surveys to verify layer thickness
Piping	Installation	Before Backfilling Trenches	Passing CQA Receipt Inspections
			Passing Pressure and Leak Test Results

ATTACHMENT B

SUPPLIER QA PROGRAM REQUIREMENTS

FOR

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)

CELLS 9 & 10

SUPPLIER QA PROGRAM REQUIREMENTS

Attachment to WCH PR# R013213A00

The following elements of DOE O 414.1, Title 10 Code of Federal Regulations (CFR) 830, Subpart A and elements of ASME NQA-1-2000, marked below, apply to this contract:

This part to be completed by WCH Engineering and QA&S										
Applicable DOE QA Rules and Orders (when checked)										
<input checked="" type="checkbox"/>	DOE O 414.1 (QA Order) CRD Requirements (nuclear and non-nuclear items or activities)									
<input checked="" type="checkbox"/>	DOE-Wide Suspect/Counterfeit Items (S/CI) Prevention Process									
<input type="checkbox"/>	Safety Software Requirements									
<input checked="" type="checkbox"/>	10 CFR 830 Subpart A (QA Rule) Requirements (nuclear items or activities)									
<input checked="" type="checkbox"/>	1. Management/Criterion 1 - Program									
<input checked="" type="checkbox"/>	2. Management/Criterion 2 - Personnel Training & Qualification									
<input checked="" type="checkbox"/>	3. Management/Criterion 3 - Quality Improvement									
<input checked="" type="checkbox"/>	4. Management/Criterion 4 - Document and Record									
<input checked="" type="checkbox"/>	5. Performance/Criterion 5 - Work Process									
<input type="checkbox"/>	6. Performance/Criterion 6 - Design									
<input checked="" type="checkbox"/>	7. Performance/Criterion 7 - Procurement									
<input checked="" type="checkbox"/>	8. Performance/Criterion 8 - Inspection and Acceptance Testing									
<input checked="" type="checkbox"/>	9. Assessment/Criterion 9 - Management Assessment									
<input type="checkbox"/>	10. Assessment/Criterion 10 - Independent Assessment									
<input type="checkbox"/>	HASQARD <input type="radio"/> Volume I <input type="radio"/> Volume II <input type="radio"/> Volume III <input type="radio"/> Volume IV									
Other requirements:										
<input type="checkbox"/>	Subpart 2.7 - QA Requirements for Computer Software for Nuclear Facility Applications									
BASIC REQUIREMENT					SUPPLEMENTAL REQUIREMENTS					
<input checked="" type="checkbox"/>	1/100	Organization	<input type="checkbox"/> 200	<input type="checkbox"/> 300						
<input checked="" type="checkbox"/>	2/100	Quality Assurance Program	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400	<input type="checkbox"/> 500				
<input type="checkbox"/>	3/100	Design Control	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400	<input type="checkbox"/> 500	<input type="checkbox"/> 600	<input type="checkbox"/> 700	<input type="checkbox"/> 800	<input type="checkbox"/> 900
<input checked="" type="checkbox"/>	4/100	Procurement Document Control	<input checked="" type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400					
<input checked="" type="checkbox"/>	5/100	Instructions, Procedures & Drawings								
<input checked="" type="checkbox"/>	6/100	Document Control	<input type="checkbox"/> 200	<input type="checkbox"/> 300						
<input checked="" type="checkbox"/>	7/100	Control of Purchased Items & Services	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400	<input type="checkbox"/> 500	<input type="checkbox"/> 600	<input type="checkbox"/> 700	<input type="checkbox"/> 800	
<input checked="" type="checkbox"/>	8/100	Identification and Control of Items	<input checked="" type="checkbox"/> 200	<input checked="" type="checkbox"/> 300						
<input checked="" type="checkbox"/>	9/100	Control of Special Processes	<input checked="" type="checkbox"/> 200	<input checked="" type="checkbox"/> 300	<input checked="" type="checkbox"/> 400					
<input checked="" type="checkbox"/>	10/100	Inspection	<input checked="" type="checkbox"/> 200	<input checked="" type="checkbox"/> 300	<input checked="" type="checkbox"/> 400	<input checked="" type="checkbox"/> 500	<input checked="" type="checkbox"/> 600	<input checked="" type="checkbox"/> 700		
<input checked="" type="checkbox"/>	11/100	Test Control	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400	<input type="checkbox"/> 500	<input checked="" type="checkbox"/> 600			
<input checked="" type="checkbox"/>	12/100	Control of Measuring & Test Equipment	<input checked="" type="checkbox"/> 200	<input checked="" type="checkbox"/> 300	<input checked="" type="checkbox"/> 400					
<input checked="" type="checkbox"/>	13/100	Handling, Storage & Shipping	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400	<input type="checkbox"/> 500	<input type="checkbox"/> 600			
<input checked="" type="checkbox"/>	14/100	Inspection, Test & Operating Status								
<input checked="" type="checkbox"/>	15/100	Control of Nonconforming Items	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400					
<input checked="" type="checkbox"/>	16/100	Corrective Action								
<input checked="" type="checkbox"/>	17/100	Quality Assurance Records	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400	<input type="checkbox"/> 500	<input type="checkbox"/> 600	<input type="checkbox"/> 700	<input type="checkbox"/> 800	
<input type="checkbox"/>	18/100	Audits	<input type="checkbox"/> 200	<input type="checkbox"/> 300	<input type="checkbox"/> 400	<input type="checkbox"/> 500	<input type="checkbox"/> 600	<input type="checkbox"/> 700	<input type="checkbox"/> 800	

ATTACHMENT C

CONSTRUCTION SUBCONTRACT SUBMITTALS

FOR

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)
CELLS 9 & 10

Exhibit "I" (Attachment A) Subcontractor Submittal Requirements Summary

Submittal Schedule F Prior to Fabrication S Prior to Shipment B Prior to Balance of Payment A Per S/C Schedule M Prior to Mobilization W Prior to Commencing Work U Prior to Use X Prior to Purchase Y Prior to Progress Payment for Each Specific Task Z As Required/Needed/Discovered 14 No. Indicates Calendar Days After Award D <u>Installation of material, or component.</u> E <u>Energying/Installation of Utility System</u> 30, W Designates number of Days submittal is required prior to work point on Schedule W, 30 Designates number of Days submittal is required following this work point on Schedule 14C Designates number of Days submittal is required after completion of this work	Submittal Type Required O Original P Prints/Photocopies T Transparencies M Microfilm PH Photographs CD Compact Disk S Sample (2) A number indicates quantity of copies Q _____	Distribution Designation CC CONOPS Coordinator DC Document Control ENV Environmental EPL Environmental Project Lead ES Engineering Services FM Field/Functional Manager FP Fire Protection Engineer PCE Project Controls PR Procurement PSS Procurement Subcontract Specialist QA Quality Assurance RC Radiation Control SA Subcontract Administrator SH Safety & Health SME Subject Matter Expert SOMP Site Occupational Medical Provider STR Subcontract Technical Representative WM <u>Waste Management</u>
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<i>Notices</i>							
1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.							
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.							
Contract Submittals							
Items to be Sent to Subcontract Administrator							
Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY		
			Schedule	(No.) and Type	Review	Info Copy	Send to/for
5-00 ENGINEERING							
5-01 Drawings, Dam and Samples	--	--	--	--	--	--	--
5-01a Drawings	Exhibit "B," SC-4.3.2.1	DC	14, W	O	ES	STR	
5-01b Samples	Exhibit "B," SC-4.3.2.2	DC	30, W	O	ES	STR	
5-01c Data and Certificates	Exhibit "B," SC-4.3.2.3	DC	30, W	O	ES	STR	
5-01d As-Built Drawings Initial Energized Electrical Utilities	Exhibit "B," SC-4.3.2.5.2, and SC-5.1.7	DC	E, 30	O, P	ES	STR	
5-01e As-Built Drawings-Initial for Non-Electrical Utilities	Exhibit "B," SC-4.3.2.5.2, and SC-5.1.7	DC	E, 30	O, P	ES	STR	
5-01f As-Built Drawings-Final for all work including energized utility systems	Exhibit "B," SC-4.3.2.5.2, and SC-5.1.7	DC	30, B	O, P, CD	ES	STR	
5-01h As-Built Specifications-Final	Exhibit "B," SC-4.3.2.6	DC	30, B	O, P	ES	STR	
5-02 Omissions or Discrepancies on Documents	Exhibit "B," SC-5.1.1	DC	Z	O, P	ES	STR	
5-03 Plans for Performing Work	Exhibit "B," SC-4.4	DC	Z	O, P	STR	PCE	ES
5-09 Construction Quality Control (CQC) Plan	0600X-SP-G0048	DC	30, M	O, P	ES	QA	STR
5-10 Acceptance Test Procedures (ATP)	0600X-SP-G0048, 2.12	DC	U (14 days prior)	O, P(2)	ES	QA	STR
5-11 Acceptance Test Procedures Test Execution Sheet (Completed)	0600X-SP-G0048, 2.12	DC	D, 7	O, P(2) CD	ES	QA	STR
5-12 Electrical Design	Exhibit "G," 4.2.08	DC	W	O, P	SME	STR	ES

**Exhibit "I" (Attachment A)
Subcontractor Submittal Requirements Summary**

5-13	Traffic Control Plan	Exhibit "D," 2.1.1.4	DC	30, M	O, P	STR SH	
5-14	Stockpile Plan	0600X-SP-C0075, 3.15	DC	30, M	O, P	ES STR	
5-15	Excavation Records	0600X-SP-C0075, 3.24	DC	Z	O, P	ES STR	
5-16	Construction Activities Equipment List	0600X-SP-C0050, 1.5.1	DC	M	O	STR	
5-17	Construction Equipment Certification	0600X-SP-C0050, 1.5.1	DC	M	O	STR	
5-18	Equipment Inspection and Preventive Maintenance Program	0600X-SP-C0050, 1.5.2	DC	M	O, P	SH STR	ES
5-19	Admix Preparation Plan	0600X-SP-C0076, 1.4.2 & 3.2.5	DC	30M	O, P	ES STR	
5-20	Admix Liner Placement Plan	0600X-SP-C0076, 1.4.3	DC	30M	O, P	ES STR	
5-21	Admix Bentonite Manufacturer's Data and Certifications	0600X-SP-C0076, 2.1	DC	U (30 days prior)	O, P(2)	ES QA STR	
5-22	Admix Certifications	0600X-SP-C0076, 1.4.4 & 2.1	DC	S	O, P(2)	ES QA STR	
5-23	Admix Measuring Equipment Calibration Certificates	0600X-SP-C0076, 1.4.4 & 3.2.1	DC	U	O, P (2)	ES QA STR	
5-24	Admix Pugmill Operator Qualifications	0600X-SP-C0076, 3.2.2	DC	W	O, P	ES STR	
5-25	Admix Test Fill CQC Report	0600X-SP-C0076, 3.3	DC	D, 14	O, P(2)	ES QA STR	
5-26	Admix Layer Subgrade Certification	0600X-SP-C0076, 3.4	DC	Prior to Admix Liner Installation	O, P(2)	ES QA STR	
5-27	Admix Layer Subgrade CQC Report	0600X-SP-C0076, 3.4	DC	D, 14	O, P(2)	ES QA STR	
5-28	Admix Layer CQC Report	0600X-SP-C0076, 3.7	DC	D, 14	O, P(2)	ES QA STR	
5-29	Admix Liner Surface Certification	0600X-SP-C0076, 1.4.4 & 3.6.3	DC	Prior to Geomembrane Installation	O, P(2)	ES QA STR	
5-30	Interface Friction Testing Results	0600X-SP-C0077, 1.5.4	DC	At least 30 days prior to Geomembrane Shipment	O, P	ES STR	
5-31	Geosynthetics Installer Qualifications	0600X-SP-C0077, 3.1.2	DC	90	O, P	ES STR	
5-32	Geosynthetics Installation Plan	0600X-SP-C0077, 1.4.2, 3.1.4	DC	90	O, P	ES STR	
5-33	Extrudate Documentation	0600X-SP-C0077, 3.4.1.1	DC	S	O, P	ES STR	
5-34	Seam Numbering System	0600X-SP-C0077, 3.4.2	DC	W	O, P	ES STR	
5-35	Test Equipment Calibration Certificates	0600X-SP-C0077, 3.5.2.1	DC	S	O, P(2)	ES QA STR	
5-36	Geomembrane Materials	0600X-SP-C0077, 2.1 & 2.2	DC	S	O, P	ES STR	
5-37	Geomembrane Manufacturer QC	0600X-SP-C0077, 2.3	DC	S	O, P (2)	ES QA STR	
5-38	Geomembrane QC Certification	0600X-SP-C0077, 1.4.3	DC	D, 14	O, P (2)	ES QA STR	
5-39	Geotextile Installation Plan	0600X-SP-C0077, 3.9.1	DC	90	O, P	ES STR	
5-40	Geotextile Materials	0600X-SP-C0077, 2.2	DC	S	O, P	ES STR	
5-41	Geotextile Manufacturer QC	0600X-SP-C0077, 2.2.3	DC	S	O, P (2)	ES QA STR	

Exhibit "I" (Attachment A)
Subcontractor Submittal Requirements Summary

5-42	Geotextile QC Certification	0600X-SP-C0077, 1.4.3; 2.2.4	DC	D, 14	O, P (2)	ES QA STR
5-43	Geocomposite Installation Plan	0600X-SP-C0077, 3.10.1	DC	90	O, P	ES STR
5-44	Geocomposite Materials	0600X-SP-C0077, 2.3	DC	S	O, P	ES STR
5-45	Geocomposite Manufacturer QC	0600X-SP-C0077, 2.3.2; 2.3.3.3	DC	S	O, P (2)	ES QA STR
5-46	Geocomposite QC Certification	0600X-SP-C0077, 1.4.3; 2.3.3	DC	D, 14	O, P (2)	ES QA STR
5-47	Drainage Gravel Placement Plan	0600X-SP-C0078, 1.4.1 & 3.3	DC	30	O, P	ES STR
5-48	Operations Layer Placement Plan	0600X-SP-C0078, 1.4.2; 3.4	DC	W	O, P	ES STR
5-49	Type A Drainage Gravel Material	0600X-SP-C0078, 2.2	DC	U	O, P	ES STR
5-50	Type B Drainage Gravel Material	0600X-SP-C0078, 2.3	DC	U	O, P	ES STR
5-51	Type C Drainage Gravel Material	0600X-SP-C0078, 2.4	DC	U	O, P	ES STR
5-52	Lysimeter Drainage Gravel CQC Report	0600X-SP-C0078, 3.5	DC	D, 14	O, P (2)	ES QA STR
5-53	Secondary Drainage Gravel CQC Report	0600X-SP-C0078, 3.5	DC	D, 14	O, P (2)	ES QA STR
5-54	Primary Drainage Gravel CQC Report	0600X-SP-C0078, 3.5	DC	D, 14	O, P (2)	ES QA STR
5-55	Operations Layer Material	0600X-SP-C0078, 2.4	DC	U	O, P	ES STR
5-56	Operations Layer CQC Report	0600X-SP-C0078, 3.5	DC	D, 14	O, P (2)	ES QA STR
5-57	Concrete Construction Materials Data	0600X-SP-C0079, 2.0-2.9	DC	Z	O, P	ES STR
5-58	Concrete Construction Shop Drawings	0600X-SP-C0079, 1.4.1	DC	S	O, P	ES STR
5-59	Concrete Construction Mix Design	0600X-SP-C0079, 1.4.2	DC	14, U	O, P	ES STR
5-60	Concrete Construction CQC Report	0600X-SP-C0079, 1.4.3, 3.1.3	DC	D, 14	O, P (2)	ES QA STR
5-61	Crest Pad Building Installation Instructions	0600X-SP-C0080, 1.6.D.1	DC	S	O, P	ES STR
5-62	Crest Pad Building Manufacturer's Certifications	0600X-SP-C0080, 1.6.D.2 0600X-SP-C0081, 1.5.2, 1.5.3,	DC	S	O, P (2)	ES QA STR
5-63	Crest Pad Building Erector's Certifications	0600X-SP-C0080, 1.6.D.3 0600X-SP-C0081, 1.5.4	DC	30 D	O, P (2)	ES QA STR
5-64	Crest Pad Building Manufacturer's Certificate of Proper Installation	0600X-SP-C0080, 1.6.D.4	DC	D, 14	O, P	ES STR
5-65	Crest Pad Building Manufacturer's Guarantee	0600X-SP-C0080, 1.9A	DC	S, B	O, P	ES STR
5-66	Crest Pad Building CQC Report	0600X-SP-C0080, 3.8 0600X-SP-C0081, 1.19,	DC	D, 14	O, P (2)	ES QA STR
5-67	Plastic Marking Tape Manufacturer's Data	0600X-SP-C0075, 1.5.1, 1.5.3, 2.2	DC	S	O, P	ES STR
5-68	Erosion Control materials Manufacturer's Data	0600X-SP-C0075, 1.5 1.1, 1.5.3, 2.3	DC	S	O, P	ES STR
5-69	Chain Link Fence Manufacturer's Data	0600X-SP-C0075, 1.5.1, 1.5.3, 2.4	DC	S	O, P	ES STR
5-70	Select Granular Material Data	0600X-SP-C0075, 1.5.1, 1.5.3, 2.5	DC	S	O, P	ES STR

**Exhibit "T" (Attachment A)
Subcontractor Submittal Requirements Summary**

5-71	CSBC Material Data	0600X-SP-C0075, 1.5.1, 1.5.3, 2.9	DC	S	O, P	ES STR	
5-72	CSTC Material Data	0600X-SP-C0075, 1.5.1, 1.5.3, 2.10	DC	S	O, P	ES STR	
5-73	Site Work Field Testing Control	0600X-SP-C0075, 1.5.2, 3.18	DC	Z	O, P(2)	ES QA STR	
5-74	As-Built Shop Drawings	0600X-SP-C0081, 1.5.1	DC	F	O, P	ES STR	
5-75	Welder Qualifications	0600X-SP-C0081, 1.6.1	DC	W	O, P(2)	ES QA STR	
5-76	Weld Inspection Certificates	0600X-SP-C0081, 1.5.4	DC	D, 14	O, P(2)	ES QA STR	
5-77	Suspect/Counterfeit Warrant	0600X-SP-C0081, 1.5.10	DC	S	O, P(2)	ES QA STR	
5-78	Metal Material Data	0600X-SP-C0081, 2.0	DC	S	O, P	ES STR	
5-79	Identification Tags Materials Data	0600X-SP-A0025, 1.4.1, 1.4.2, 3.2, 4.9	DC	S	O, P	ES STR	
5-80	Valve Identification Tags	0600X-SP-A0025, 4.9.1 0600X-SP-M0032, 3.2.2	DC	S	O, P	ES STR	
5-81	Coating Materials Data & Test Reports	0600X-SP-A0025, 1.6, 2.1	DC	S	O, P	ES STR	
5-82	Pipe Label Materials Data	0600X-SP-A0025, 3.1, 4.9	DC	S	O, P	ES STR	
5-83	Electrical Materials and Equipment Manufacturer's Data	0600X-SP-E0025, 2.0	DC	S	O, P	SME STR	
5-84	Electrical Materials and Equipment Manufacturer's Installation Instructions	0600X-SP-E0025, 3.1	DC	S	O, P	SME STR	
5-85	Electrical Cable Installation Plan	0600X-SP-E0025, 3.2 Exhibit "D," 2.11.3	DC	U	O, P	SME STR	
5-86	Electrical Cable Installation Reports	0600X-SP-E0025, 1.6.4	DC	E, 7	O, P	SME STR	
5-87	Electrical Factory Testing Reports	0600X-SP-E0025, 1.6.1, 1.6.3	DC	S	O, P(2)	SME QA STR	
5-88	Electrical Field Testing Plan	0600X-SP-E0025, 1.6.2, 1.6.3, 3.29	DC	20, W	O, P	SME STR	
5-89	Electrical O&M Manuals	0600X-SP-F0025, 1.6.5	DC	F, 7	O, P	SME STR	
5-90	Low-Voltage Cable Test Records	0600X-SP-E0025, 3.29.4	DC	W	O, P(2)	SME QA STR	
5-91	Installation Inspection Report	0600X-SP-C0082, 1.6.2	DC	D, 14	O, P	ES STR	
5-92	Manufacturer's Liner Warranty	0600X-SP-C0082, 1.8	DC	D, 14	O, P(2)	ES QA STR	
5-93	Tank Tightness Testing Results	0600X-SP-C0082, 3.3.3	DC	U	O, P(2)	ES QA STR	
5-94	Leachate Piping System Manufacturer's Data	0600X-SP-M0032, 1.5.1, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.14	DC	S	O, P	ES STR	
5-95	Leachate Piping System Installation Instructions	0600X-SP-M0032, 1.5.2, 3.3, 3.4	DC	S	O, P	ES STR	
5-96	Leachate Pipe Testing Procedures	0600X-SP-M0032, 3.5	DC	U	O, P	ES STR	
5-97	Leachate Pipe System CQC Report	0600X-SP-M0032, 3.7	DC	D, 14	O, P(2)	ES QA STR	
5-98	Leachate Pipe Statement of Satisfactory Installation	0600X-SP-M0032, 1.5.3	DC	D, 14	O, P(2)	ES QA STR	

Exhibit "T" (Attachment A)
Subcontractor Submittal Requirements Summary

5-99 Leachate Pump Factory Test Results	0600X-SP-M0033, 1.4.8	DC	S	O, P(2)	ES QA STR
5-100 Leachate Pump System Manufacturer's Data	0600X-SP-M0033, 1.5.1	DC	S	O, P	ES STR
5-101 Leachate Pump Equipment and Materials List	0600X-SP-M0033, 1.5.2	DC	S	O, P	ES STR
5-102 Leachate Pump System Installation Instructions	0600X-SP-M0033, 1.4.8, 3.1	DC	S	O, P	ES STR
5-103 Leachate Pump System Test Reports	0600X-SP-M0033, 1.5.3, 3.3	DC	S	O, P(2)	ES QA STR
5-104 Leachate Pump System O&M Manuals	0600X-SP-M0033, 1.5.4	DC	A	O, P	ES STR
5-105 Leachate Pump System CQC Records	0600X-SP-M0033, 3.5	DC	D, 14	O, P(2)	ES QA STR
5-106 Piping, Valves, and Specials Manufacturer's Data	0600X-SP-M0032, 1.5.1 & 2.0	DC	S	O, P	ES STR
5-107 Piping, Valves, and Specials Installation Instructions	0600X-SP-M0032, 1.5.2, 1.6, 3.0	DC	S	O, P	ES STR
5-108 Piping, Valves, and Specials Installation Personnel Qualifications	0600X-SP-M0032, 3.4	DC	S	O, P	ES STR
5-109 Piping, Valves, and Specials Hydrostatic Testing Procedures	0600X-SP-M0032, 3.5	DC	S	O, P(2)	ES QA STR
5-110 Piping, Valves, and Specials Test Equipment Calibration Certificates	0600X-SP-M0032, 3.5.1	DC	S	O, P(2)	ES QA STR
5-111 Quality Control Records	0600X-SP-A0025, 4.10	DC	S	O, P(2)	ES QA STR
5-112 Records, Tests, and Corrective Action	0600X-SP-A0025, 4.10	DC	S	O, P(2)	ES QA STR
5-113 Manufacturer's Literature	0600X-SP-C0075, 1.5.1	DC	S	O, P	ES STR
5-114 Commercial Testing Laboratory Qualifications and Procedures	0600X-SP-C0075, 1.5.2	DC	S	O, P(2)	ES QA STR
5-115 Materials Test Reports	0600X-SP-C0075, 1.5.3	DC	U	O, P	ES STR
5-116 Calibration Tests and Density Tests	0600X-SP-C0075, 3.18	DC	D, 14	O, P(2)	ES QA STR

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP			
1. <input checked="" type="checkbox"/> Work may proceed. 2. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4. <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5. <input type="checkbox"/> Permission to proceed not required.			
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.			
	CIVIL STRUCTURAL ARCHITECTURAL MECHANICAL	ELECTRICAL	MECHANICAL
	PROCESS WATER	LAND	PROJECT REP
	ENVIRONMENTAL	WASTE MANAGEMENT	SAFETY
	INDUSTRIAL HYDRAULIC	HAZARDOUS WASTE	QA
	FIELD ENGINEER	Other	
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	DOCUMENT ID NUMBER		
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CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

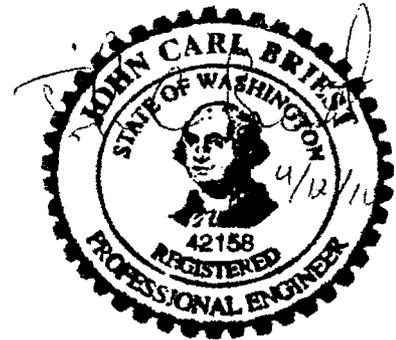
FOR ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) CELLS 9 & 10

DOCUMENT CONTROL *De 04/17/10*

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**WCH - DOCUMENT
CONTROL**



Rev.	Date	Reason for Revision	Originator	Checker	Project Engineer	LEAD Design Eng.
1	04/12/10	Clarify Two-Stage Borehole Testing	SM	Z	NCW	EB
0	11/13/09	Issued for Award	MRH	BLN	MS	JCB
Washington Closure Hanford, LLC		RIVER CORRIDOR CLOSURE CONTRACT		Job No. 14655	Contract No. 0600X-QA-G0005	
				Page 1	of 51	

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP) CONTENTS

1.0	INTRODUCTION.....	4
1.1	PURPOSE.....	4
1.2	SCOPE.....	4
1.3	RELATIONSHIP TO WCH'S QUALITY ASSURANCE PROGRAM.....	5
1.4	CHANGE CONTROL PROCEDURES.....	5
2.0	PROJECT ORGANIZATION.....	5
2.1	RESPONSIBILITY AND AUTHORITY.....	6
2.1.1	Owner.....	6
2.1.2	Permitting Agencies.....	6
2.1.3	River Corridor Closure Contractor.....	6
2.1.4	Operations Subcontractor.....	7
2.1.5	QA/QC.....	7
2.1.6	Construction Manager.....	7
2.1.7	Engineering STR.....	7
2.1.8	Designer.....	7
2.1.9	Construction STR.....	7
2.1.10	CQA STR.....	8
2.2	PROJECT MEETINGS.....	9
2.2.1	CQA/Construction Coordination Meeting.....	9
2.2.2	Plan of the Day Meetings.....	10
2.2.3	Weekly Progress Meetings.....	10
2.2.4	Non-Conformance Meetings.....	11
2.3	HOLD POINTS.....	11
3.0	PERSONNEL QUALIFICATIONS AND TRAINING.....	11
3.1	CQA OFFICER.....	11
3.2	CQA ENGINEER.....	12
3.3	CQA FIELD PERSONNEL.....	12
4.0	INSPECTION ACTIVITIES.....	12
4.1	EARTHWORKS.....	13
4.1.1	Excavation.....	13
4.1.2	Fill.....	13
4.2	ADMIX SOIL LINER.....	14
4.2.1	Pre-Construction.....	14
4.2.2	Test Fill.....	15
4.2.3	Construction.....	17
4.2.4	Post Construction.....	19
4.3	GRAVEL DRAINAGE LAYERS.....	20
4.3.1	Post-Construction.....	20

4.4	OPERATIONS LAYER	20
4.4.1	Construction.....	20
4.4.2	Post-Construction	21
4.5	ANCHOR, UTILITY, AND SIDE SLOPE RISER PIPE TRENCHES.....	21
4.5.1	Construction.....	21
4.5.2	Post-Construction	22
4.6	HDPE GEOMEMBRANE LINER.....	22
4.6.1	Preconstruction	22
4.6.2	Construction.....	24
4.6.3	Post-Construction	30
4.7	LEACHATE COLLECTION SYSTEM (LCS)	30
4.7.1	Pre-Construction	31
4.7.2	Construction.....	31
4.7.3	Post-Construction	36
5.0	DOCUMENTATION	36
5.1	DAILY REPORTS	36
5.2	INSPECTION DATA SHEETS	38
5.3	NONCONFORMANCE REPORTING.....	38
5.4	DESIGN CHANGES AND CLARIFICATIONS	39
5.5	PROGRESS REPORTS.....	39
5.6	FINAL DOCUMENTATION	40
5.7	STORAGE OF RECORDS	40
6.0	REFERENCES	40

TABLES

TABLE 4-1.	SOIL MINIMUM TESTING REQUIREMENTS.....	45
4-1.1	EARTHWORK	45
4-1.2	ADMIX SOIL LINER.....	46
4-1.3.	GRAVEL DRAINAGE LAYERS	47
4-1.4	OPERATIONS LAYER.....	47
4-1.5	ANCHOR TRENCH/SIDE SLOPE RISER PIPE TRENCH	47
TABLE 4-2.	GEOSYNTHETIC MATERIALS MINIMUM TESTING REQUIREMENTS	48
4-2.1.	HDPE GEOMEMBRANE	48
4-2.2	GEOTEXTILE	49
4-2.3.	GEOCOMPOSITE	49
4-2.4	GEONET	50
TABLE 4-3.	ERDF CONSTRUCTION HOLD POINTS	51

CONSTRUCTION QUALITY ASSURANCE PLAN (CQAP)

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) has contracted with Washington Closure Hanford, LLC (WCH) to construct two additional cells (Cells 9 & 10) at the Environmental Restoration Disposal Facility (ERDF) on the Hanford site near Richland, Washington. Cells 9 & 10 will be constructed adjacent to the existing cells and the liner systems will be joined to form a single uninterrupted liner system. This Construction Quality Assurance Plan (CQAP) describes the construction quality assurance activities required during the construction of Cells 9 & 10.

1.1 PURPOSE

During facility construction, Construction Quality Assurance (QA) activities will be required to ensure that:

- (1) Components are constructed in accordance with the plans and specifications; and
- (2) Requirements of agencies related to documentation are satisfied. The agencies involved with ERDF are the DOE and the U.S. Environmental Protection Agency (EPA).

This CQAP has been prepared to describe the activities that will be performed during construction to satisfy these objectives. Procedures invoked by the CQAP are intended to identify problems that may occur during construction and to document that these problems are corrected before construction is complete.

This CQAP is intended to satisfy the regulatory requirements and guidance established in 40 CFR 264.19 (EPA), WAC 173-303-335 (Ecology), and EPA/600/R-93-182 *Quality Assurance and Quality Control for Waste Containment Facilities, 2nd Edition, Waste Containment Facilities, ASCE Press, 2007*.

This CQAP is to function and be executed independently of the Construction SUBCONTRACTOR's Construction Quality Control (CQC) program, except when nonconformance in the Construction SUBCONTRACTOR's program or product are identified. The Construction SUBCONTRACTOR's CQC activities during construction, including test methods, location, frequency, and similar requirements, are defined in the Technical Specifications for the construction subcontract and are not modified in any way by this CQAP.

1.2 SCOPE

This CQAP establishes general administrative and documentation procedures. With respect to specific inspection and testing activities, this plan addresses only those activities associated with construction of the disposal trench and the support facilities that will be performed for Cells 9 & 10. Specific work items include:

- Excavation
- Soil testing
- Construction of admix soil liner test fill
- Production and placement of admix soil liner
- Construction of anchor trenches and side slope riser trenches
- Procurement, testing, and installation of geosynthetics
- Installation of components and facilities for leachate collection and removal system and utility zone monitoring system
- Placement of gravel drainage layers
- Placement of the operations layer
- Site grading (civil survey, layout, etc)

1.3 RELATIONSHIP TO WCH'S QUALITY ASSURANCE PROGRAM

This CQAP and the CQA SUBCONTRACTOR's Quality Assurance Program (QAP) are secondary documents, developed under the requirements of the project QA program embodied in the current approved versions of the *River Corridor Closure Contract Quality Assurance Program Description (QAPD)*, (WCH-51). The QAPD is the site-wide River Corridor Closure Contractor's quality assurance document. The CQAP draws upon the records management, document control, technical review, and other procedural resources invoked by the QAPD.

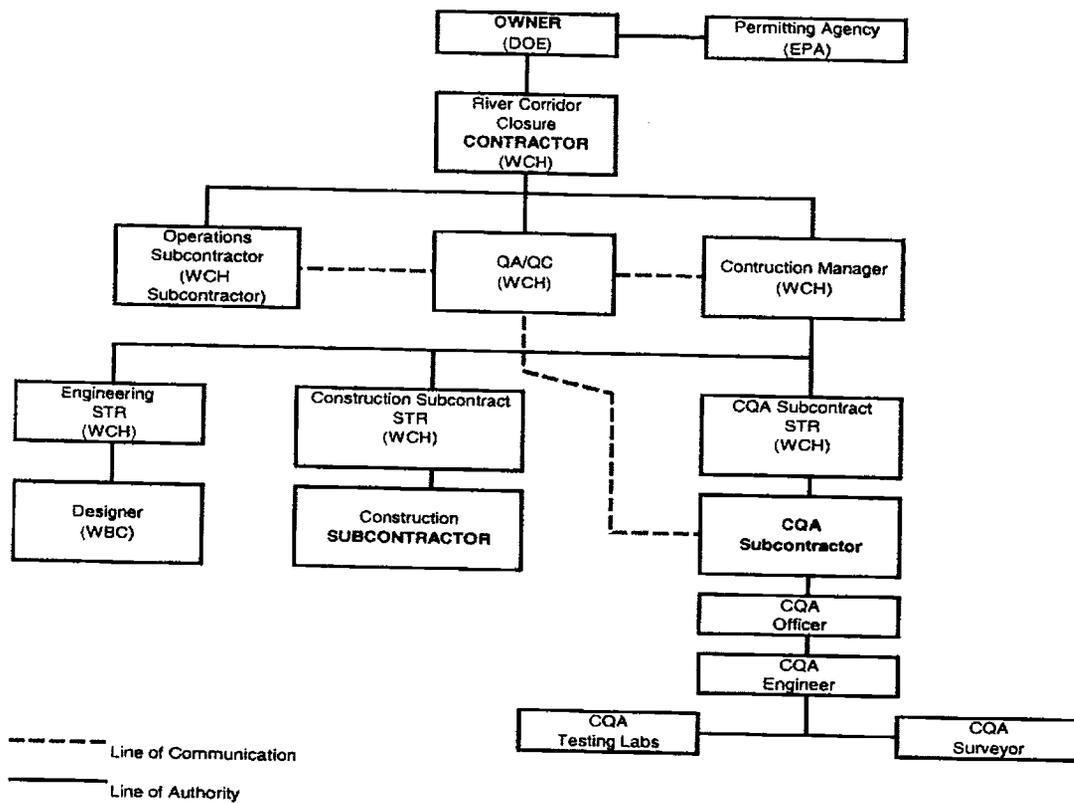
1.4 CHANGE CONTROL PROCEDURES

The CQAP and implementing procedures are subject to the change control requirements defined by the procedures established in WCH's QAPD.

2.0 PROJECT ORGANIZATION

This section describes the project organization for the construction of the ERDF Cells 9 & 10. The following sub-sections address the organizations involved in the ERDF construction, their respective roles in construction activities, and methods of interactions between organizations.

Figure 1. ERDF Construction/Quality Assurance Organization



2.1 RESPONSIBILITY AND AUTHORITY

The quality assurance organization chart for ERDF construction is shown on Figure 1. Each major organization is described in the following sections.

2.1.1 Owner

The OWNER of the ERDF is the DOE - Richland Operations Office (DOE).

2.1.2 Permitting Agencies

Cells 9 & 10 of the ERDF are being constructed to meet regulations established by the EPA. This CQAP is specifically designed to support those regulations.

2.1.3 River Corridor Closure Contractor

WCH is the River Corridor Closure Contractor for ERDF and is responsible for design, construction, and operation of the ERDF. WCH interfaces with DOE and the regulatory agencies and is responsible for ensuring that the permitting requirements of the regulatory

agencies are satisfied. WCH manages the activities of the Designer, Construction SUBCONTRACTOR, (SUBCONTRACTOR) and CQA SUBCONTRACTOR. These three activities may be conducted by different subcontractors to maintain the required degree of independence. WCH has procurement authority for ERDF Subcontracts.

2.1.4 Operations Subcontractor

The ERDF is operated by WCH for the DOE. WCH has subcontracted the operation of ERDF to an Operations Subcontractor. During construction, WCH will be responsible for review and approval of any field changes which would affect facility operations.

2.1.5 QA/QC

WCH provides quality assurance and quality control (QA/QC) oversight of the SUBCONTRACTOR and CQA SUBCONTRACTOR'S activities during construction.

2.1.6 Construction Manager

The Construction Manager, an employee of WCH, has overall responsibility for construction of the ERDF cells. The Construction Manager directs the activities of the construction project and personnel, including the Engineering Subcontract Technical Representative (STR), Construction STR, and CQA STR.

2.1.7 Engineering STR

The Engineering (STR), an employee of WCH, serves as the point of contact between the Designer and WCH. The Engineering STR oversees the preparation and review of technical documents related to the design of ERDF Cells 9 & 10.

2.1.8 Designer

ERDF Cells 9 & 10 were designed by WCH through their subcontractor, Weaver Boos Consultants, LLC (WBC). The responsibilities of the Designer include clarifying and interpreting the plans and specifications, assisting with the preparation of Design Change Notices (DCNs), incorporation of new or changed requirements, and reviewing submittals as directed by the Engineering STR. The Designer may also assist with document distribution and control if directed by the Engineering STR.

2.1.9 Construction STR

The Construction STR, an employee of WCH, serves as the point of contact between the Construction SUBCONTRACTOR and WCH. The Construction STR oversees the daily construction field activities and is the on site representative for WCH.

2.1.9.1 Construction SUBCONTRACTOR. The Construction SUBCONTRACTOR (SUBCONTRACTOR) performs the work activities associated with actual construction of ERDF

Cells 9 & 10. The SUBCONTRACTOR is responsible for implementing their own internal QC activities as defined in the Construction Subcontract, approved submittals, and other supporting documentation. The SUBCONTRACTOR reports directly to and receives direction from the WCH Construction STR. This document also refers to an Installer. The Installer is a subtier under the Construction SUBCONTRACTOR and refers to the geosynthetics installer.

2.1.10 CQA STR

The CQA STR, an employee of WCH, serves as the point of contact between the CQA Subcontractor and WCH. The CQA STR oversees the daily CQA field activities and is the on site representative for WCH.

2.1.10.1 CQA Subcontractor. A third-party CQA subcontractor shall perform the work specified in the CQAP. The CQA Officer, an employee of the CQA Subcontractor, has the overall responsibility of implementing the CQAP and directly supervises the on site CQA Engineer. The CQA Officer shall be a Registered Professional Engineer in the State of Washington and has the authority to provide certification that the ERDF cells were constructed in accordance with the Permitting Agency-approved CQAP and construction Technical Specifications and Drawings.

The CQA Subcontractor shall review the SUBCONTRACTOR'S plans and other submittals, as required by the CONTRACTOR. The CQA Subcontractor shall also be responsible for training and qualifying CQA inspection personnel on requirements, procedures, scheduling, and inspection activities, and ensuring that the CQA testing laboratories and surveyors conform to CQA Subcontract requirements. The CQA Subcontractor shall ensure that sample custody procedures are followed and test data are accurately reported and maintained for preparation of periodic reports. The most important duty of the CQA Subcontractor is confirming that the facility was constructed in accordance with plans and specifications approved by the permitting agency. The CQA Subcontractor shall report directly to and receive direction from the CQA STR.

2.1.10.2 CQA Engineer. The CQA Engineer works on site under the direction of the CQA Officer and manages the on site quality assurance personnel and CQA work; location and frequency of tests, schedule and monitor results of tests, identify deficiencies and verify that deficiencies have been corrected, complete reports and provide peer review of completed data, testing, and oversight activities. CQA field personnel work under the direction of the onsite CQA Officer and perform testing and observations in accordance with the CQAP.

2.1.10.3 CQA Testing Labs. CQA testing labs conduct the CQA tests specified in the CQAP that are not completed on site. CQA Testing labs shall be provided by the CQA Subcontractor.

2.1.10.4 CQA Surveyor. The CQA Surveyor shall provide surveys necessary for conducting the work specified in the CQAP. The CQA Surveyor shall be provided by the CQA Subcontractor. CQA surveying work shall be performed under the direction of a registered professional land surveyor in the State of Washington.

2.2 PROJECT MEETINGS

This section includes a discussion of various progress and status meetings to be held throughout construction activities. The intent of the meetings is to ensure communication between organizations involved in the construction of ERDF cells.

2.2.1 CQA/Construction Coordination Meeting

A meeting will be held to resolve any uncertainties following the award of the Construction and CQA Subcontracts. The meeting will include the organizations involved in the Construction and CQA activities, including representatives of DOE and regulatory agencies as agreed upon. The topics of this meeting will include but are not limited to:

- Reviewing the responsibilities of each organization;
- Integrated work control;
- Interface protocol (e.g. points of contact, notification process, etc.);
- Reviewing lines of authority and communication for each organization;
- Providing each organization with CQA documents and supporting information;
- Familiarizing each organization with the CQAP and its role relative to the design criteria, plans, and specifications;
- Determining any changes to the CQAP that may be needed to document that the facility will be constructed to meet or exceed the specified design requirements;
- Discussing the established procedures or protocol for observations and tests including sampling strategies;
- Discussing the established procedures or protocol for handling construction deficiencies, repairs, and retesting, including “stop work” conditions;
- Reviewing methods for documenting and reporting inspection data;
- Reviewing methods for distributing and storing documents and reports;
- Reviewing work area security and safety protocol;
- Reviewing the proposed project schedule;

- Discussing procedures for the location and protection of construction materials and for the prevention of damage of the materials from inclement weather or other adverse events; and
- Conducting a site walk-around to review construction material and inspect equipment storage locations.

The meeting will be documented in the CQA Subcontractor's meeting minutes.

2.2.2 Plan of the Day Meetings

CQA representative(s) shall attend the Construction SUBCONTRACTOR's daily Plan of the Day meetings at the work site. The purpose of the meetings is to:

- Discuss any health and safety issues;
- Review the previous day's activities and accomplishments;
- Review the work location and activities for the day;
- Discuss the SUBCONTRACTOR's personnel and equipment assignments for the day;
- Review any new test data; and
- Discuss any potential construction problems.

2.2.3 Weekly Progress Meetings

CQA representative(s) shall attend the CONTRACTOR's weekly progress meetings with the Construction SUBCONTRACTOR. The purpose of the meetings is to:

- Review the previous weeks activities and accomplishments;
- Review claims, change orders, delays, and similar items;
- Review planned activities for the upcoming week;
- Review project schedule, including but not limited to, project schedule and hold point schedule;
- Finalize resolution of problems from the previous week; and
- Discuss the potential problems with the work planned for the upcoming week.

This meeting's minutes will be documented by the CONTRACTOR.

2.2.4 Non-Conformance Meetings

Meetings will be convened as necessary to address non-conformance discovered during inspection. Deficiencies observed during construction by CQA personnel will be brought to the attention of the CONTRACTOR's STR and the Construction SUBCONTRACTOR. The Construction SUBCONTRACTOR shall document and disposition the non-conformance in accordance with the Construction SUBCONTRACTOR's Non-Conformance Reporting (NCR) procedures. The CQA Subcontractor and Designer will participate in nonconformance review meetings as requested by the WCH.

2.3 HOLD POINTS

Hold points are established for certain key activities as identified in Table 4-3. At these points, the SUBCONTRACTOR shall cease work on the affected activity until it has been reviewed by the appropriate CQA personnel. The Construction SUBCONTRACTOR shall provide CQA personnel at least one week notice prior to a hold point inspection.

3.0 PERSONNEL QUALIFICATIONS AND TRAINING

This section describes the qualifications and training required for CQA personnel.

The CQA Subcontractor shall develop and submit a Training Matrix for each position required for performance of work on the CQA Subcontract. The CQA Subcontractor is responsible for qualification, certification, and maintenance of these requirements for the personnel fulfilling these positions. The CQA Subcontractor shall submit a certification form documenting the qualifications of CQA personnel to the CONTRACTOR.

3.1 CQA OFFICER

The CQA Officer shall have landfill construction certification experience. The CQA Officer shall possess, as a minimum, a Bachelor's degree and Washington State Professional Engineer license in civil or construction engineering, engineering geology, or a closely related discipline, and shall have at least 10 years practical, technical, and managerial experience to successfully direct the CQA activities discussed in this plan. The CQA Officer's qualifications shall be documented by training records, copies of licenses, and professional resume.

The CQA Officer shall receive training in the requirements of the CQAP and the CQA Subcontractor's QAP, including but not limited to documentation, receiving inspection, equipment calibration, design control, and personnel training. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

3.2 CQA ENGINEER

The CQA Engineer shall possess, at a minimum, a Bachelor's degree in civil or construction engineering, engineering geology, or a closely related discipline, and shall have sufficient practical, technical, and managerial experience to successfully direct the on-site CQA activities specified in this CQAP. The CQA Engineer's qualifications shall be documented by training records, copies of licenses, and professional resume.

The CQA Engineer shall receive training in the requirements of the CQAP and the CQA Subcontractor's QAP, including but not limited to documentation, receiving inspection, equipment calibration, design control, and personal training. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

3.3 CQA FIELD PERSONNEL

CQA field personnel shall possess a high school diploma and at least two years of construction-related experience, including at least one year of experience conducting CQA monitoring for earthworks and geosynthetics installation, or a Bachelor of Science degree from a four year college or university and at least one year of experience conducting CQA monitoring for earthworks and geosynthetics installation.

Qualifications of CQA Personnel shall be documented by training records and professional resumes. Prior to undertaking project activities, CQA Personnel shall receive training in the requirements of the CQAP, the CQA Subcontractor's QAP, and applicable technical requirements. In addition, CQA Personnel shall be trained in the use of visual-manual soil classification techniques. Project plans and specifications shall be reviewed. The purpose of the training is to provide CQA staff with a clear understanding of expected conditions, methods of construction, and the scope of plans and specifications. Prior to beginning project activities, CQA personnel must also receive training required to perform work on the site.

4.0 INSPECTION ACTIVITIES

This section describes the inspection activities (observations and tests) that will be conducted by the CQA Subcontractor during construction of the ERDF trench and support facilities. The following subsections address each facility component separately and, if appropriate, are further subdivided into sections on pre-construction, construction, and post-construction testing and observation activities unique to each component. Soil testing requirements are summarized in Table 4-1. Geosynthetic testing requirements are summarized in Table 4-2. Hold points during construction are summarized in Table 4-3.

Sampling of soil, geosynthetic materials, and other materials will be required for testing purposes. Every sample shall be assigned a unique identification number which describes the sample location and type. Sample numbers shall be recorded by the CQA Subcontractor.

4.1 EARTHWORKS

4.1.1 Excavation

Requirements for excavation activities are described in Exhibit "D" Scope of Work, Technical Specifications, and Drawings. During excavation, CQA Personnel shall generally observe the excavated material and subgrade conditions and shall perform the following activities:

- Document moisture seeps and that soft, organic, and otherwise undesirable materials are removed.
- Notify the CONTRACTOR immediately if changed or unexpected geologic conditions are encountered.
- Coordinate with the CQA Surveyor to confirm that the depth and slope of the excavations, sumps, ramps, side slope riser trenches, surface water drainage ditches, roadways, foundations, and other construction components meet design requirements.

Observations shall be recorded on daily field monitoring report forms, drawings, and geologic maps as appropriate.

4.1.2 Fill

Requirements for fill are described in Exhibit "D" Scope of Work, Technical Specifications, and Drawings. CQA Personnel shall perform the following activities:

- Prior to placement of any structural backfill or roadway top course material in the trench or on the embankment, verify that the subgrade has been prepared (scarified, moisture-conditioned, and compacted) in accordance with the requirements of the Technical Specifications. CQA Personnel shall test the subgrade with in-place density methods at the frequency specified in Table 4-1.
- During fill and roadway top course placement in the trench or on the embankment, conduct tests and observations to document that the quality of compacted fill meets project specifications. This will include visual observation, measurement of lift thickness, verifying grain size analysis, determining moisture-compaction characteristics, and measuring in-place density and moisture content, and other tests. Field in-place density tests shall be conducted at a listed in Table 4-1. Additional tests may be conducted at the discretion of the CQA Officer.
- Coordinate with the CQA Surveyor to verify that final lines and grades conform to design requirements.
- Review SUBCONTRACTOR's soil testing and field density data to verify that materials satisfied the requirements of the Technical Specifications and that specified compaction was achieved.

Observations shall be recorded on daily field monitoring report forms, drawings, and test data forms.

Provide a daily report to the CQA STR that contains, at a minimum, fill quantities, locations, observations, problems, NCRs, deficiencies, CQA hold points witnessed/released, and observed safety issues. The report shall be submitted on the following work day.

4.2 ADMIX SOIL LINER

The requirements for the admix soil liner are described in Specification No. 0600X-SP-C0076, Cell Construction-Admix Layer, of the Technical Specifications. The CQA Personnel shall perform the following activities:

4.2.1 Pre-Construction

Preconstruction CQA activities include review of bentonite manufacturer certificates, inspection and testing of base soil preparation, inspection and testing of admix soil liner preparation, and inspection and testing of test fill construction. Each is described below:

Base soil liner materials shall be inspected to document that they satisfy the requirements of the specifications. Material inspection shall continue throughout the liner construction period. If base soil material for admix production is obtained onsite, the inspections can be performed as the material is excavated or as it is placed in the storage pile. Visual observation and classification of the excavated base soils used in admix production shall be performed. Unsuitable material shall be rejected. If base soil material for the admix layer material is obtained offsite, inspection of the soil shall be conducted as it arrives at the construction site. For borrow areas containing non-uniform materials, unacceptable soil material shall be segregated as it is excavated. CQA Personnel shall observe segregation operations carefully and document that suitable material is retained for liner construction. Changes in color or texture may be indicative of a change in soil type or soil moisture content. The soil shall be inspected for roots, stumps, large rocks, and other deleterious materials. No rocks greater than 2 inches will be allowed in the admix layer.

During mixing, CQA Personnel shall observe production and shall test the admix to document that the specified amount of bentonite is mixed uniformly with the base soil, and that water is uniformly added to the admix in the amount necessary to achieve the specified design. The bentonite content of the admix liner material shall be determined by belt scale measurements and sieve analysis.

A sufficient number of samples of the constituent materials and finished admix, as determined by the CQA Officer, shall be tested to document that material properties are within the ranges stated in the specifications. These tests shall include at least the following:

- Bentonite yield manufacturer's certificates – as indicated in Table 4-1.

- Remolded Permeability (Admix) – as indicated in Table 4-1. Additional permeability testing shall be performed whenever the base soil has < 20% passing the U.S. No. 200 Sieve by dry weight. For this testing, the base soil shall be mixed with 12% bentonite by dry weight and have moisture – density values that fall within the “acceptable zone”, as described in Specification 0600X-SP-C0076. If the permeability results are comparable to those with base soil containing > 20% fines, the base soil may be used. Otherwise, it shall be rejected.
- Soil density/moisture content relationships (Admix) – as indicated in Table 4-1.
- Maximum clod size (Admix) - Periodic visual monitoring.
- Particle size distribution (base soil and admix) (hydrometer and - #200 sieve) – as indicated in Table 4-1.
- Bentonite content of admix by belt scale measurements – as indicated in Table 4-1.
- Atterberg limits (Admix) – as indicated in Table 4-1.
- Natural water content (Admix) – as indicated in Table 4-1.
- Soil Density/Moisture Content Relationship (Admix) – as indicated in Table 4-1.

Samples shall be collected and tested by CQA Personnel. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1. Testing shall be completed and compliance with the specifications established prior to any placement of admix material. Additional samples totaling at least 200 pounds shall be collected by the CQA Personnel and archived at the direction of the CONTRACTOR. The CONTRACTOR shall hold archive samples at their discretion. If the admix properties change due to changes in the base soil or other factors, the CONTRACTOR may change the acceptable moisture and density.

4.2.2 Test Fill

A test fill shall be constructed by the SUBCONTRACTOR to demonstrate the adequacy of the materials, design, equipment, and construction procedures proposed for the admix liner. The primary purpose of the test fill is to document that the specified soil density, moisture content, and permeability values can be achieved consistently in the full-scale facility with the full-scale compaction equipment and procedures.

The test fill shall be constructed to allow determination of the relationship among density, moisture content, and permeability. Field variables can affect this relationship and must be carefully measured and controlled both in the test fill and during construction of the full-scale liner. As a minimum, the following shall be observed, sampled, tested, and documented by the CQA Personnel:

- The compaction equipment type, configuration, and weight

- The number of passes of the compaction equipment
- The method used to breakdown clods before compaction and the maximum allowable clod size
- The method used to control and adjust moisture content, including equilibration time, and the quantity of water to be used in any adjustment
- The speed of the compaction equipment traveling over the liner
- The uncompacted and compacted lift thicknesses
- Types of rutting (depths, widths, etc.).
- Relatively undisturbed samples of the test fill shall be collected by the CQA Subcontractor using Shelby tubes for laboratory permeability tests. The Construction SUBCONTRACTOR will assist in collecting the Shelby tubes.
- Following collection of permeability samples, the holes shall be repaired and the methodology for repairing holes in the soil liner shall be evaluated by CQA Personnel. Holes less than or equal to 2 inches in diameter shall be repaired by backfilling with admix liner or bentonite chips, pellets, or powder in lifts no more than 6 inches thick and hand-tamping with a steel rod or other suitable device to firmly compact each lift. The methods and materials that will be used in the repair process shall be documented by CQA Personnel. Performance of repaired soil liner sections shall be equal to or exceed the performance of undisturbed liner sections. The resulting procedures shall be followed during repair of testing or sampling holes during full-scale liner construction.
- The test fill construction shall include the removal and replacement of a portion of the soil liner to evaluate the method proposed for repair of defective portions of the full-scale liner.
- A Two Stage Borehole (Boutwell) Test (ASTM D6391) shall be performed on the test fill to evaluate the large-scale vertical permeability (horizontal hydraulic conductivity is not required). The Two Stage Borehole (Boutwell) Test shall be installed by the CQA Subcontractor, CQA Personnel shall direct installation of the equipment, perform the test, and evaluate the data with support from the SUBCONTRACTOR.
- Evaluation of layer bonding shall be determined by CQA Personnel using test pits to make visual observations. A minimum of two test pits shall be excavated in each test fill after test fill construction has been completed. The test pits shall be excavated entirely through the test fill using a backhoe, post hole digger or other approved method. Test pit locations shall be determined by CQA Personnel. Test pits will be completed by SUBCONTRACTOR.

The number and frequency of field and laboratory tests to be conducted during the test fill are listed below:

Additional tests may be conducted at the direction of the CQA Officer. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1. The CQA Officer shall compare the results of field and laboratory testing to the required specifications. Any failing tests shall be reported to the CONTRACTOR.

Additional test fills shall be constructed for each borrow source and whenever significant changes occur in the liner material, equipment, or procedures used to construct the soil liner.

4.2.3 Construction

Low-permeability admix liner shall be constructed by using the materials equipment and procedures used in the test fill and as documented by CQA Personnel. Criteria to be used for determining the acceptability of the liner shall be as identified in the project specifications. The CQA process for admix liner are intended to accomplish three objectives:

1. Ensure that the admix liner materials are suitable.
2. Ensure that the admix liner materials are properly placed and compacted.
3. Ensure that the completed liner is properly protected.

Subgrade preparation shall be observed for compliance with the specifications.

To document that proper construction practices are followed, CQA Personnel shall observe the liner material placement and compaction process. During material spreading, the following shall be documented:

- Area to be covered is lightly scarified and moisture conditioned to facilitate bonding;
- Liner material is spread adequately to obtain complete coverage and the specified loose lift thickness;
- Equipment used to transport material does not affect lower material that was previously scarified;
- Oversize clods in the liner material are discarded or reduced in size;
- Soil moisture content is adjusted appropriately in the event of a significant prolonged rain or drought during construction;
- When required, water is adequately spread and incorporated to obtain full penetration through clods and uniform distribution;

- Significant water loss and desiccation cracking before and after compaction are prevented through the use of water application, covering, or other appropriate methods; and
- At tie-in locations, any dry, cracked, or otherwise unsuitable areas of the existing admix is removed.

During the soil liner compaction process, the following shall be documented:

- Compaction equipment is of the same type, configuration, and weight as used in the test fill;
- The equipment speed and number of passes for compaction is the same as used in the test fill;
- Coverage by compaction equipment is uniform, especially at compacted fill edges, in equipment turnaround areas, and at the tops and bottoms of slopes;
- The specified soil density, water content, and permeability throughout each completed lift is achieved. This will be determined by laboratory and field testing;
- Hydraulic Conductivity values obtained for undisturbed soil liner samples are consistent with values obtained for undisturbed samples from the test fill. Undisturbed sample locations are staggered from lift to lift so holes do not align vertically;
- Penetrations or holes resulting from the collection of undisturbed soil samples or the use of density or moisture probes are repaired using the same materials and methods used for repairs on the test fill. CQA personnel shall repair all holes resulting from CQA sampling or testing activities;
- Repaired sections are tied-in with undisturbed sections of the liner;
- Compacted lifts are tied together by scarifying the top of each lift, if necessary, with appropriate equipment prior to applying the following lift;
- Newly placed material is thoroughly kneaded into existing admix at tie-in locations;
- Sufficient liner strength to maintain stable sidewalls and to supply a stable base for supporting overlying materials is maintained while achieving the minimum specified density. This shall be monitored with moisture-density testing in accordance with the procedures listed in Table 4-1. In place field density tests and moisture content tests shall be conducted at a frequency as listed in Table 4-1. Additional tests may be conducted as directed by the CQA Officer. If a nuclear density gauge is used to measure the in-place density of the admix, then at least one rubber balloon, drive cylinder, or sand cone density test shall be conducted per day to confirm the results of the nuclear gauge.

Moisture content measured with the nuclear gauge shall be validated by collecting a minimum of one sample per day for laboratory moisture determination. ASTM D4643 (microwave moisture content) may be used after a reliable correlation between oven dried (ASTM D2216) and microwave results is established;

- Protective covers to prevent desiccation of liner material after completion of the liner are placed in a timely manner where necessary; overbuilding the liner can be considered protective cover; and
- Equipment traffic is routed and controlled such that accidental damage of installed portions of the soil liner is prevented.

Climatic conditions shall be considered when construction methods are chosen. Construction methods may be restricted on work performed during and just after a rainfall, during very hot or windy conditions, or during freezing weather. For example, more compactive effort must sometimes be applied to achieve the same density as soil temperature falls. In very dry weather, the surface water content of each compacted fill layer can be altered in a short time by drying, making continuous watering and blending necessary. Atmospheric conditions shall be observed and recorded by CQA Personnel, and appropriate actions shall be taken when unsuitable weather conditions exist.

At locations where the field testing indicates that moisture contents or densities are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

Shelby tube samples of the in place soil liner shall be obtained at a minimum frequency as listed in Table 4-1 for material placed. The testing frequency shall be increased if the admix material changes significantly. At any time, additional samples may be obtained at the discretion of the CQA Officer or CQA Engineer. At least one sample shall be taken from a corner area. Laboratory Hydraulic Conductivity tests shall be conducted on these samples to document compliance with the specifications.

The CQA Engineer shall monitor on a periodic basis the soil liner surface for desiccation and irregularities to document compliance with the specifications. The completed liner shall be protected from desiccation, erosion, and freezing following completion of the uppermost lift.

4.2.4 Post Construction

Immediately before placement of any geomembrane, the soil liner shall be inspected for cracks, holes, defects, or any other features that may increase its permeability. Defective areas shall be repaired. If the underlying foundation is defective (e.g., soft or wet), then this material shall be removed and the resultant volume replaced. Excavated areas of the soil liner shall be repaired by the method demonstrated during test fill construction; inspection shall document that there is continuity between the repaired and undisturbed areas.

Special attention shall be paid to the final inspections of the sump area, sidewall and bottom slopes, liner coverage, and liner thickness. The CQA Engineer shall coordinate with the CQA Surveyor to confirm that minimum design thicknesses and grades are achieved prior to placement of any additional material over the soil liner.

4.3 GRAVEL DRAINAGE LAYERS

The requirements for the gravel drainage layers are described in 0600X-SP-C0078, Cell Construction, of the Specifications. The CQA Personnel shall perform the following activities:

- Visually observe the material for contamination by debris or deleterious material;
- Visually observe the material for uniformity;
- Sample the material for grain size and permeability tests at a frequency as listed in Table 4-1 for material delivered to the site;
- Observe the placement of the material to confirm minimum thickness under spreading and hauling equipment to prevent damage to the underlying liner materials and components of the leachate collection system; and
- Observe placement and compaction of the material around piping and risers in the sumps.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.3.1 Post-Construction

The CQA Engineer shall coordinate with the CQA Surveyor to document that minimum thicknesses and design grades in the gravel layer have been achieved prior to the placement of any additional materials over the top of the gravel.

4.4 OPERATIONS LAYER

The requirements for the operations layer are described in 0600X-SP-C0078, Cell Construction, of the Specifications. The CQA Personnel shall perform the following activities:

4.4.1 Construction

CQA Personnel shall obtain samples of the proposed operations layer material prior to placement in the landfill. Samples shall be obtained at a frequency as listed in Table 4-1 and tested to document that the material meets the gradation requirements in the specifications. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

During placement of the operations layer material, CQA Personnel shall observe the placement operations on a full-time basis and perform the following:

- Visually observe the material for contamination with debris or deleterious material;
- Visually observe the material for particle size;
- Sample the material for grain size tests at a frequency as listed in Table 4-1 for material placed in the facility;
- Observe the placement of the material to confirm minimum thickness under equipment to prevent damage to the underlying liner materials;
- Visually observe that the operations layer placement on the slopes is conducted in compliance with the procedures outlined in the specifications;
- Visually observe to detect any damage to the underlying liner materials; and
- Visually observe the moisture conditioning, placement, and compaction of the material placed adjacent to the primary slope riser pipes.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.4.2 Post-Construction

The CQA Officer shall coordinate with the CQA Surveyor to confirm that minimum thicknesses and design grades in the operations layer have been achieved prior to the placement of any waste materials.

4.5 ANCHOR, UTILITY, AND SIDE SLOPE RISER PIPE TRENCHES

The requirements for the anchor trenches and side slope riser pipe trenches are described in 0600X-SP-C0075, Sitework, of the Specifications. The CQA Personnel shall perform the following activities:

4.5.1 Construction

CQA Personnel shall obtain samples of the proposed backfill materials for anchor trenches, utility trench and side slope riser pipe trenches prior to backfilling these trenches. Samples shall be obtained at a frequency as listed in Table 4-1 for each material or a minimum of one sample, whichever is greater. Samples shall be tested to confirm that the material meets the gradation requirements in the specifications. Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

During placement of backfill in the anchor trenches, utility zone trench and riser pipe trenches, CQA Personnel shall observe the placement operations on a periodic basis and perform the following:

- Visually observe the material for contamination with debris or deleterious material;

- Visually observe the material for particle size;
- Sample the material for grain size tests at the frequency listed in Table 4-1 for material placed;
- Visually observe that the material is moisture conditioned and compacted as specified;
- Visually observe that backfill around riser pipes does not contain voids;
- Observe the placement of the material to document minimum thickness under equipment to prevent damage to the underlying materials; and
- Visually observe to detect any damage to the underlying liner materials.

Tests shall be conducted in accordance with the methods and procedures specified in Table 4-1.

4.5.2 Post-Construction

There are no specific post-construction requirements for anchor trench, utility trench, side slope riser pipe trench backfill.

4.6 HDPE GEOMEMBRANE LINER

The requirements for the HDPE geomembrane liner are described in 0600X-SP-C0077, Cell Construction - Geosynthetics, of the Specifications. The CQA Personnel shall perform the following activities:

4.6.1 Preconstruction

Preconstruction activities for HDPE geomembrane liner include inspection of the raw materials, manufacturing operations, fabrication operations, and final product quality; observations related to transportation, handling, and storage of the membrane; observation of foundation preparation; and review of the personnel qualifications, training, and equipment to be used to install the HDPE geomembrane liner. In addition, CQA Personnel shall perform conformance tests on samples of the HDPE liner material submitted by the geomembrane installer. These activities are discussed in the following subsections. Samples of the geomembrane totaling at least 100 ft² shall be collected by the CQA personnel and archived by the CONTRACTOR.

4.6.1.1 HDPE Manufacture. Quality assurance requirements for the geomembrane manufacturer initially consist of evaluating the raw polymer materials. The resin supplier shall provide documentation with each shipment or production lot confirming that the raw materials comply with the manufacturers' product properties and performance requirements. The Manufacturer shall test each batch (lot) of resin to verify that the raw material meets or exceeds the specifications. The CQA Officer shall submit to the CONTRACTOR an inspection plan for the raw polymer materials in the manufacturer's facilities. The CQA Officer shall inspect the

raw polymer materials only with CONTRACTOR's approval. Any source inspection activities shall be performed in compliance with the surveillance inspection procedures and non-conformances shall be documented and submitted to the CONTRACTOR for disposition and resolution.

CQA Personnel shall review testing results and other documentation submitted by the geomembrane Manufacturer for conformance to the specification requirements. Submittals from the Manufacturer include the following:

- the origin (Resin Supplier's name, resin production plant), identification (brand name, number) and production date of the resin;
- a list of quantities and descriptions of materials other than the base polymer which comprise the geomembrane;
- a copy of the quality control certificates issued by the Resin Supplier;
- reports on the tests conducted by the Manufacturer and the CQA Laboratory to confirm that the quality of the resin used to manufacture the geomembrane satisfies the specifications;
- a statement that no recycled polymer is added to the resin or that recycled polymer is clean and does not exceed 2% by weight, and does not include material that has seen previous service life;
- a properties sheet including properties listed in the specifications, measured using test methods indicated in the specifications, or equivalent;
- reports on the tests, including sampling procedures, conducted by the Manufacturer and/or the CQA Laboratory to confirm that the geomembrane meets the project specifications; and
- a certification that property values given in the properties sheet are guaranteed by the Geomembrane Manufacturer.

4.6.1.2 Receiving Inspection and Conformance Testing. The CQA Personnel shall perform receiving inspection on geomembrane material in compliance with procedures, and nonconformances shall be documented and submitted to the CONTRACTOR for disposition and resolution. CQA Personnel shall also confirm that transportation, handling, and storage of geomembrane are performed in accordance with the specifications and manufacturer's instructions, and shall determine the condition of rolls of geomembrane upon delivery to the site.

CQA Personnel shall remove samples to be tested to determine conformance to the design specifications and the manufacturer's specifications. Samples shall be obtained and tested in accordance with the methods and frequencies listed in Table 4-1. Prior to shipment or after delivery of the rolls of geomembrane, CQA Personnel shall remove samples and forward them to

the geosynthetics testing laboratory. Samples of geomembrane shall be taken across the entire width of the roll and shall not include the first three feet. Unless otherwise specified, samples shall be three feet long by the roll width.

CQA Personnel shall examine results from laboratory conformance testing and shall notify the CONTRACTOR of any such nonconformance. Rolls of geomembrane which do not meet or exceed required specifications shall be rejected and brought to the attention of the CONTRACTOR.

4.6.1.3 Bedding Surface. CQA Personnel shall confirm that the surface upon which the geomembrane will be installed is suitably prepared and will not damage the geomembrane. Details of required observations are presented in the specifications and are summarized in the following paragraphs.

The geomembrane bedding layer shall be free of clods, rocks, sticks, sharp changes in grade, ruts greater than 1 inch, desiccation cracks, and standing water. Where the bedding surface is the low permeability admix liner, methods shall be taken to prevent the soil liner surface from drying and cracking prior to installing the geomembrane. These methods may include the use of a temporary cover. Desiccation cracks larger than the limits listed in the specifications shall be repaired using approved methods as described in the Specifications.

The Geomembrane Installer (Installer) shall inspect and provide written certification to the CONTRACTOR and the CQA Officer that the prepared surface under consideration is suitable for installation of the geomembrane.

After acceptance of the prepared surface, it shall be the Installer's responsibility to notify the CONTRACTOR and the CQA Personnel of any deterioration in the prepared surface resulting from weather or other causes beyond the Installer's control. Repairs required to restore the surface as a result of such causes shall be made as directed by the CONTRACTOR. Any damage to the prepared surface caused by installation or other causes relating to performance of the work shall be the responsibility of the SUBCONTRACTOR.

4.6.2 Construction

Sheets of geomembrane will be welded together after they are placed in the trench to form a continuous moisture barrier. CQA Personnel shall document that the placement and seaming activities are performed in accordance with the specifications; particularly that required materials, methods, and testing procedures are employed. CQA Personnel shall also review documentation submitted by the Geomembrane Installer, testing laboratories, and other parties as listed in the specifications. Seams or repaired areas which do not pass the tests shall be repaired and retested as described in the specifications until a passing result is achieved. Requirements for geomembrane installation and testing are described in detail in the specifications and are summarized in the following subsections.

4.6.2.1 Placement of Geomembranes. Prior to placing geomembranes in the landfill, the Geomembrane Installer shall provide scale drawings showing the proposed placement pattern and field seam locations to the CONTRACTOR and CQA Personnel for review.

Each field panel and field seam shall be given an identification code which is consistent with the proposed sequence of installation. A field panel is defined as the area of geomembrane which is to be cut and seamed in the field by the Installer. Unless otherwise directed, the Installer shall place the field panels in the sequence shown on the installation drawings. CQA Personnel shall verify that the geomembrane is not placed during inclement weather as specified in the Technical Specifications.

Equipment used for placement shall not damage the geomembrane or the subgrade by handling, trafficking, leakage of hydrocarbons, or in other ways. Personnel working on the geomembrane shall not engage in any activities or wear footwear which could damage the geomembrane. Direct contact of any heavy mechanical equipment with the geomembrane shall not be allowed.

Panels shall be carefully unrolled according to the Manufacturer's instructions, and in a manner that does not scratch or crimp the geomembrane. Panels shall be aligned to minimize wrinkles or "fishmouths", especially along the field seams. Adequate precautions (such as placement of sand bags) shall be taken to minimize the likelihood of wind uplift.

Any field panel or part of a field panel which becomes seriously damaged shall be replaced at the direction of the CQA Officer or CONTRACTOR. Minor damage, such as small wrinkles, crimps, etc., shall be repaired using approved procedures as described in the specifications. Damaged field panels which have been rejected for use shall be removed from the site.

4.6.2.1.1 Field Seaming of Geomembrane

Personnel

The Geomembrane Installer shall provide the CONTRACTOR and CQA Officer with a list of the Installer's proposed seaming personnel and their previous seaming experience. Seaming personnel shall be required to pass a seaming test prior to commencement of field seaming operations.

Field Seaming Methods and Equipment

General: Only seaming methods and equipment meeting the specifications shall be used for field seaming of the geomembrane panels.

Where conditions warrant, the Installer may be allowed to use a temporary support surface between the geomembrane and the subgrade to achieve proper support conditions during seaming operations. The use of such support methods shall be subject to the approval of the CQA Officer. The support shall not be left in place and shall be removed on completion of seaming.

Wherever possible, wrinkles or "fishmouths" shall be pulled out of the overlap area prior to seaming. Where this cannot be done, they shall be cut along the ridge of the wrinkle in order to

achieve a flat surface. Such cuts shall be seamed. Where the overlap is inadequate, an oval or round patch of the same geomembrane, extending a minimum of 6 inches beyond the cut in directions, shall be seamed onto the geomembrane.

Extrusion Welding Process: Extrusion welding apparatus shall be equipped with gauges to measure the temperature at the nozzle or the preheat temperature of the apparatus. The CQA Personnel shall monitor the extrudate and ambient temperature at appropriate intervals. The extruder shall be purged of heat-degraded extrudate at the beginning of each seaming sequence.

Artificially induced cooling of extrudate welds (using water or any other means) shall not be allowed. Sufficient time between welding and non-destructive testing shall be taken so that nondestructive testing procedures do not cause artificial cooling of the extrudate.

Fusion Welding Process: Fusion welding apparatus shall be automated, self-propelled devices which produce either a single seam or a double seam with an enclosed central air space. The apparatus shall be equipped with gauges which indicate the equipment temperatures during welding. For the seaming of cross-seams, the top and bottom edges of the cross-seam shall be ground to a smooth incline prior to seaming.

The CQA Personnel shall log ambient and seaming apparatus temperatures, as well as seaming apparatus speed for each seam.

Seam Overlap and Preparation: Prior to seaming, geomembrane rolls or panels shall be overlapped as specified in the Technical Specifications. Procedures used to temporarily bond adjacent rolls together shall not result in damage to the geomembrane. If mechanical devices such as hot air leisters are used for temporary bonding, the air temperature at the nozzle of such equipment shall be controlled so as not to damage the geomembrane. Solvents or adhesives shall not be used.

Seams shall be aligned to create as smooth a surface as practicable with a minimum of wrinkles and "fishmouths". The area in the immediate vicinity of the seam shall be free of moisture, dust, dirt, debris, or any other foreign material and, if necessary, sheltered from wind and dust immediately prior to and during the seaming operation. If grinding is required along the seam, this shall be done according to the Manufacturer's recommendations, within one hour of the seaming operation and in a way which does not damage the geomembrane. This process also shall include cleaning the seam area with a brush or forced air immediately prior to seaming. Particular care shall be paid to the condition of existing geomembrane prior to tie-in with new geomembrane.

The CQA Personnel shall document geomembrane seam overlaps and preparation procedures.

Weather Conditions

Seaming shall not be attempted in inclement weather as specified in the Technical Specifications.

Trial Seams

Trial seams shall be made and tested to verify that adequate conditions exist for field seaming to proceed. Each seamer shall produce a trial seam at the beginning of each shift. Additional trial seams shall be made and tested as specified in the Technical Specifications. This frequency may change at the discretion of the CQA Officer with approval of the CONTRACTOR. The CQA Personnel shall monitor and log the trial seam results.

4.6.2.1.2 Nondestructive Testing of Field Seams

General

Seams shall be nondestructively tested by the Installer over their full length to verify their continuity. It should be noted that this testing does not provide any information regarding seam strength. Nondestructive testing shall be performed concurrently with field seaming using the equipment and procedures described below. Testing equipment and procedures other than those given below shall be subject to approval by the CONTRACTOR prior to their use. Any seam which fails the nondestructive test shall be repaired in accordance with approved procedures as described in the Specifications. Repairs shall be retested to determine the success of the repair.

Where CQA Personnel determine that seams cannot be nondestructively tested due to physical constraints, the seams shall be capped with the same geomembrane or double seamed. CQA Personnel shall observe the seaming and capping of such seams to assess their adequacy and determine whether additional action is required. Where such a seam is accessible for testing prior to final geomembrane deployment, testing shall be performed prior to deployment.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

Vacuum Testing

For extrusion and single wedge fusion welded seams, seams shall be evaluated using vacuum box testing as specified in the Technical Specifications. The vacuum box shall consist of a rigid housing with a transparent viewing window on top and a soft, flexible gasket attached to the bottom of the housing. A port hole and valve assembly along with a calibrated vacuum gauge shall be provided at one end of the housing. The vacuum gauge shall be calibrated prior to initial use on the project and recalibrated on at least an annual basis, at the end of the project, or at the discretion of the CQA Officer. The Installer shall supply vacuum gauge calibrations to the CQA Officer for review prior to the start of testing. A steel vacuum tank and pump assembly complete with the necessary pressure controls, pipe connections, pressure hoses, and fittings shall be provided. A soapy solution and a method of dispensing the solution are also required.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

Air Pressure Testing

This test method (ASTM D5820) shall apply only when the double hot wedge fusion seaming method is used to form the seam. The testing equipment shall consist of an air pump capable of generating and sustaining pressure of at least 40psi complete with a pressure gauge and the necessary pressure hose, fittings, and connections. An approved pressure feed device such as a

sharp hollow needle shall be provided to penetrate into the central air channel at one end of the seam. A second calibrated pressure gauge in 1psi increments capable of reading pressures up to 40 psi shall be provided to detect any pressure loss at the opposite end of the seam from the pressure feed device. The pressure gauges shall be calibrated prior to initial use on the project and recalibrated on at least an annual basis, at the projects end or at the discretion of the CQA Officer. The Installer shall supply pressure gauge calibrations to the CQA Officer for review prior to the start of testing. The test shall be performed as specified in the Technical Specifications.

The non-destructive testing shall be conducted by the Installer and monitored by CQA Personnel.

4.6.2.2 Destructive Testing of Field Seams. Destructive testing of field seams shall be performed at selected locations in order to verify that seams satisfy the strength requirements listed in the specifications. Sampling and testing shall be done concurrently with field seaming operations so that corrective action, if required, may be implemented as the work progresses. Samples shall be taken for testing so as to achieve a minimum average daily frequency as listed in Table 4-2. Sample locations shall be determined by CQA Personnel based on the required sampling frequency and seaming observations. The Installer shall not be informed in advance of the locations where the seam samples will be taken. Additional test locations may be required during seaming operations such as along tie-in seams with existing geomembranes. The necessity for such additional sampling and testing shall be determined by CQA Personnel, and extra testing shall be performed when there is cause to suspect the presence of excess crystallinity, contamination, offset welds, or any other potential defect. The CQA Officer may increase the minimum frequency of destructive testing as the work progresses based on the results of previous testing.

Samples shall be cut by the Installer under the observation of CQA Personnel. Samples may be cut prior to nondestructive seam testing. Each sample shall be numbered and identified. The sample number and location shall be recorded by CQA Personnel on the layout drawings.

The test sample shall measure approximately 12 inches wide by 42 inches long with the seam centered lengthwise. The sample shall be cut into three equal parts having a minimum length of 12 inches. One sample shall be taken by CQA Personnel for destructive testing under laboratory conditions. One sample shall be given to the Installer to perform CQC testing. The third sample shall be kept in storage by the CONTRACTOR.

The area from which the test sample was cut shall be immediately repaired in accordance with approved procedures described in the Specifications. Seams created for these repairs shall be nondestructively tested in accordance with Section 4.6.2.1.2.

Neither of the field tests shall fail in the seams. The results of the laboratory testing by CQA Personnel shall in any case determine the acceptability of the field seam. The tests shall be performed in accordance with the methods listed in Table 4-2.

Passing values for field testing are defined in specification 0600X-SP-C0077. Field testing shall meet these values for each test otherwise the seam will be considered failing.

A field seam shall only be considered acceptable when it is bounded by two destructive test locations which meet the seam strength requirements listed in the specifications, as well as passing the nondestructive tests described in Section 4.6.2.1.2. Whenever a sample fails a destructive test the Installer shall repair the failed seam as specified in the Technical Specifications.

The continuity of capped seams shall be verified by nondestructive testing in accordance with Section 4.6.2.1.2. In addition, if the total capped seam length exceeds 150 feet, a destructive sample shall be taken for laboratory testing as described above.

The CQA Personnel shall document actions taken in conjunction with destructive test failures.

4.6.2.3 Repairs. The entire geomembrane surface shall be examined by CQA Personnel in order to confirm that the geomembrane is free of any defects, holes, blisters, undispersed raw materials, or contamination by foreign matter. Particular attention shall be paid to existing geomembrane in tie-in areas. Whenever possible, the examination of the geomembrane surface shall be done prior to any seaming in that area. If necessary, the geomembrane surface shall be cleaned by the Installer so that it is free of dust, mud, or any other materials which may inhibit a thorough examination of the surface. Any suspect areas shall be clearly marked by CQA Personnel and nondestructively tested by the Installer in accordance with Section 4.6.2.1.2. Any location which fails to pass the nondestructive testing or from where a destructive test sample has been removed shall be repaired using one of the procedures described below.

Small tears, wrinkles, scratches, or pinholes shall be repaired by the Installer using spot welding, seaming, or patching, as appropriate. Large holes and tears, undispersed raw materials, and any areas which have been contaminated by foreign matter shall be repaired by the Installer as specified in the Technical Specifications.

Repairs shall be nondestructively tested using the appropriate methods described in Section 4.6.2.1.2. Unless additional destructive testing is required as described in Section 4.6.2.2, repairs which pass the nondestructive test shall be accepted as being adequate. Any repairs which fail the nondestructive test shall not be accepted, and the Installer shall perform the necessary remedial work and retest the repaired area until it passes the nondestructive testing criteria.

Upon completion of field seaming and testing, and prior to any placement of materials on top of the geomembrane, CQA Personnel shall identify any large wrinkles or "fishmouths" which may have been built into the geomembrane. Any such features shall be cut out, repaired, and tested by the Installer.

In any given area, no work shall proceed with any materials which may cover the geomembrane until repairs in that area have been successfully made. As the work progresses, CQA Personnel shall document locations requiring repair work and shall confirm that repairs have been successfully made.

Materials in Contact with Geomembrane. Equipment used for placing and compacting overlying soil materials shall not be driven directly on to any geosynthetic material. The minimum thickness of material maintained between the geomembrane and the equipment shall be as specified in the Technical Specifications. Equipment shall be observed by the CQA Personnel during placement to document that no leakage of hydrocarbons occurs, particularly on top of the geomembrane.

Placement of soil materials on top of the geomembrane shall not be allowed within 50 feet of any unseamed edge of geomembrane until field seaming of that edge is complete. This is required to allow sufficient room to work out any large wrinkles or "fishmouths" prior to seaming.

The placement of cover materials shall be done with caution and in a manner which is least likely to cause wrinkles in, or damage to, the geomembrane. The CQA Personnel shall monitor the placement of cover materials over the geomembrane on a regular basis.

4.6.3 Post-Construction

Site Clean-up

Upon completion of work in any given area, CQA Personnel shall examine that area to determine whether waste and extraneous materials have been removed and that the area has been left in a satisfactorily clean condition to allow placement of materials on top of the geomembrane.

Completion of Work

The installation of the geomembrane shall be considered as complete when: (1) required deployment, field seaming, testing, repairs, retesting, and site clean-up have been completed by the Installer and approved by CQA Personnel; (2) the Installer has submitted the required quality control certificates and work/inspection records to the CONTRACTOR; and (3) the CQA Subcontractor is satisfied that the geomembrane has been installed in accordance with the plans and specifications.

4.7 LEACHATE COLLECTION SYSTEM (LCS)

The requirements for the leachate collection system (LCS), leachate transmission system, and leachate storage tanks are described in the following sections of the Specifications (most current revisions):

<u>Section Title</u>	<u>New Section No.</u>
Geosynthetics	0600X-SP-C0077
Leachate Collection System	0600X-SP-C0078
Crest Pad Building	0600X-SP-C0080
Leachate Tank	0600X-SP-C0082
Pipe, Valves, and Specials	0600X-SP-M0032
Leachate Pumps	0600X-SP-M0033
Crest Pad Piping	0600X-SP-M0032
Crest Pad Valves	0600X-SP-M0032

Meters, General	0600X-SP-M0032
Electrical Distribution System, Underground	0600X-SP-E0025
Electrical Work, Interior	0600X-SP-E0025

The CQA Personnel shall perform the following activities:

4.7.1 Pre-Construction

CQA Personnel shall inspect leachate collection, transmission, and storage system materials, equipment, and components when they are delivered to the site to confirm that they conform to the design criteria and specifications. Receiving inspection shall be performed in compliance with the procedures specified in the CQAP and CQA Subcontractor's QAP. Non-conformances shall be documented and submitted to the CONTRACTOR for disposition and resolution. In general, activities performed by CQA Personnel shall include the following:

- Inspect materials upon arrival at the site to confirm conformance to the specifications;
- Inspect piping components to confirm (from appearance and shipping documents) that they are constructed of materials as listed in the plans, specifications, and procurement documents and that they are not damaged. Take measurements to confirm that pipe is of specified size and wall thickness and that perforations are sized and spaced as specified;
- Observe and test to confirm that sand and gravel materials conform to the specifications, are of the proper size and gradation, and do not contain unacceptable types of materials. Testing requirements for the drainage layers are outlined in Section 4.3;
- Inspect to confirm that prefabricated structures (tanks, manholes, etc.) are as specified in the design. Such items include, but are not limited to, non-HDPE piping systems, prefabricated HDPE components, electrical equipment, and monitoring equipment. Inspection shall include visual observation of any corrosion-resistant coatings to document that they are present and without flaw. The CONTRACTOR shall be informed of the acceptance status of all such items prior to installation; and
- Witness, inspect and document LCS equipment, system components, and mechanical/electrical equipment to confirm they meet specification requirements. Acceptance Tests (AT) shall be performed by the Construction SUBCONTRACTOR and observed by CQA Personnel.

4.7.2 Construction

4.7.2.1 Pipe Network Installation. The HDPE pipe network shall be placed according to Technical Specifications and Drawings. CQA monitoring activities shall include:

- Review of construction subcontractor's submittals concerning joining methods and type of perforations;

- Review of manufacturer's certification to document that the HDPE pipe meets the specifications;
- Visually observe that the geonet and geotextile layers are placed over the geomembrane prior to pipe installation;
- Observe and measure to confirm that the pipes are placed at specified locations and in specified configurations, and that pipe grades are as specified;
- Verify that the internal cleanliness of HDPE pipe is maintained;
- Visually observe that pipes are joined together and perforated in accordance with the approved procedures. Visual inspection of the carrier pipe is not required when double containment pipe is joined using the double butt fusion process (the pipes will be pressure tested);
- Observe that the placement of any filter or backfill materials around the pipe proceeds as shown on the plans;
- Witness, review, and document testing of HDPE piping prior to being buried or covered with liner; and
- Observe that backfilling and compaction are completed as specified and that, in the process, the pipe network is not damaged.

4.7.2.2 Drainage Layer. Inspection of the drainage layer shall include:

- Testing the material to confirm that it has the specified particle size and is free from excessive amounts of fines or organic materials (See Section 4.3);
- Measuring the thickness and observing coverage of each drainage layer as it is placed in the LCS (coordinate with CQA Surveyor); and
- Surveying the completed layer to document that specified slopes and grades are obtained (coordinate with CQA Surveyor).
- Placement of the drainage layers shall not damage any component of the underlying composite liner or the piping.

4.7.2.3 Geosynthetics

Manufacture

The geosynthetics manufacturers shall provide a list of guaranteed properties for the type of geosynthetics to be delivered. The manufacturers shall also provide written certification signed by a responsible party that the materials actually delivered have properties which meet or exceed the guaranteed values.

Rolls of geosynthetics shall be marked or tagged with the following information:

- manufacturer's name,
- product identification,
- lot number,
- roll number, and
- roll dimensions.

If any special handling of the materials is required, it shall be so marked, e.g., "This Side Up" or "This Side Against Geonet".

Shipment, Handling, and Storage

The geotextile and geocomposite material shall be protected from ultraviolet light exposure, precipitation or inundation by water, mud, dirt, dust, puncture, cutting, and any other damaging or deleterious conditions as specified in the Technical Specifications. CQA Personnel shall document that geonets are free of dirt and dust just before installation. If the geonets are judged dirty or dusty, they shall be washed by the Installer prior to installation.

Conformance Testing

Geosynthetics samples shall be obtained and tested in accordance with the phase, test methods, and frequencies listed in Table 4-2. CQA Personnel shall remove samples and forward them to an approved geosynthetic laboratory for testing to document conformance to both the design specifications and the list of guaranteed properties. Samples shall be taken across the entire width of the roll and shall not include the first 0.9 meter (three feet). Unless otherwise specified, samples shall be 0.9 meter (three feet) long by the roll width. The machine direction shall be marked on the samples with an arrow.

CQA Personnel shall examine all results from laboratory conformance testing and shall report any nonconformance to the CQA Officer and the CONTRACTOR.

Installation

The geosynthetics Installer shall handle geosynthetics in such a manner that they are not damaged. On slopes, the geocomposite material shall be securely anchored in the anchor trench and then rolled down the slope in such a manner as to continually keep the geocomposite sheet in tension. In the presence of wind, geotextiles, geocomposites, and geonets shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during placement and shall remain until replaced with earth cover material. Geotextiles, geonets, and geocomposites shall be cut using approved cutters only. Special care shall be taken to protect other materials from damage which could be caused by the cutting of the geotextile, geocomposite, and geonet materials. The Installer shall take any necessary precautions to prevent damage to underlying layers during

placement of the geotextile, geocomposites, or the geonet. During placement of geotextile and geocomposite materials, care shall be taken not to entrap stones, sandbags, excessive dust, or moisture that could damage the geosynthetic material, clog drains or filters, or that might hamper subsequent seaming. Geotextiles and geocomposites shall not be dragged across textured geomembranes.

CQA Personnel shall visually examine the entire surface of the geotextile and geocomposite layers after installation to confirm that no potentially harmful foreign objects, such as needles, are present. In addition, the CQA Personnel may undertake a sweep of the entire geotextile surface using a metal detector, to determine the presence of any such items.

During placement of geonets, care shall be taken not to entrap dirt or excessive dust that could cause clogging of the drainage system, and stones that could damage the adjacent geomembrane. If dirt or excessive dust is entrapped in the geonet, it shall be hosed clean prior to placement of the next material on top of it. In this regard, care should be taken with the handling of sandbags, to prevent rupture or damage. Care shall be taken not to leave tools in the geonet. CQA personnel shall confirm that all geonet is covered with geotextile on the same day it is deployed.

Seams

Geosynthetics shall be seamed as specified in the Technical Specifications.

CQA Personnel shall visually examine geosynthetics seams to document that the specified requirements have been met.

Repair

Holes or tears in the geosynthetics shall be repaired as specified in the Technical Specifications.

CQA Personnel shall visually observe and document geosynthetics repair procedures.

Soil Placement

Soil shall not be placed in direct contact with geonets.

The Installer shall place soil materials on top of geotextiles or geocomposites in such a manner that there is:

- no damage to the geotextile, geocomposite, or underlying layers;
- minimal slippage of the geotextile or geocomposite on the underlying layers; and
- no excess tensile stresses in the geotextile or geocomposite.

CQA Personnel shall visually observe that the above conditions are satisfied.

4.7.2.4 Leachate Collection, Transmission, and Storage System Equipment and Components

Electrical System and Pump Controls

The electrical system which controls the leachate pumps shall be checked for proper installation and operation. The SUBCONTRACTOR's CQC activities are described in the pertinent sections of the specifications. CQA Personnel shall perform the following activities:

- Receipt inspections of electrical components (verify UL, listings, etc.);
- Review construction subcontractor's submittals and proposed equipment to document compliance with the specifications;
- Verify and document final tagging, labeling, and marking of the electrical systems (i.e. breaker, outlets, disconnects, switches, etc.); and
- Perform or review component checks of resistance, grounding, and load prior to complete system check.

Pumps, Piping, Meters, and Valves

The pumps, piping, instruments (such as the flow meters), and valves that are included in the leachate collection (removal and transfer) system shall be examined and tested at the system level for conformance to the specifications and proper performance. CQA Personnel shall perform the following activities in conjunction with these items:

- Review construction subcontractor's submittals and equipment deliveries to the site to verify conformance with the specifications;
- Review the results of subcontractor's acceptance testing of the piping system;
- Verify and document final tagging, labeling, and marking of the electrical systems (i.e. breaker, outlets, disconnects, switches, etc.);
- Review system performance checks to confirm operation in accordance with the specifications; and
- Review the complete leachate removal system performance using the installed pumps as described in the specifications.

Leachate Storage Tank System

The leachate storage tank, cover, piping, instruments (such as the level measurement), and valves shall be examined and tested at the system level for conformance to the specifications and proper performance. CQA Personnel shall perform the following activities in conjunction with these items:

- Review construction subcontractor's submittals and equipment deliveries to the site to verify conformance with the specifications;
- Oversight of subgrade and foundation preparation; placement and compaction of backfill; placement of reinforcing steel and anchor bolts; concrete placement; placement of shop-fabricated tank parts; erection of field-erection tank parts; installation of piping, pumping, and other ancillary equipment to verify conformance with the specifications;
- Oversight of installation and testing of tank liner systems to verify conformance with the specifications;
- Review the results of subcontractor's acceptance testing of the system;
- Verify and document final tagging, labeling, and marking of the systems (i.e. breaker, outlets, disconnects, switches, etc.);
- Review system performance checks to confirm operation in accordance with the specifications; and
- Review the complete leachate removal system performance using the installed pumps as described in the specifications.

Acceptance Test Plan

CQA Personnel will observe and record the results of the Acceptance Tests. The acceptance tests will be performed by the SUBCONTRACTOR to demonstrate that the installed pumps, piping, leachate storage tank, instrumentation, and electrical system components function as intended by the design.

4.7.3 Post-Construction

The post-construction inspection of the LCS shall include observations to confirm that systems and components have been installed in the proper locations and according to the design drawings, Construction Specifications, and Manufacturer's specifications.

5.0 DOCUMENTATION

This section describes the documentation required during construction of ERDF Cells 9 & 10.

5.1 DAILY REPORTS

Daily reports shall be completed by CQA Personnel when they are on site. CQA Personnel shall be assigned field books which will be labeled with a unique number issued by the CQA Officer. The field CQA Personnel shall record field observations and the results of field tests either in their assigned field book or on standard field data sheets. After each book is filled and at the end

of the project, the field books shall be returned to the CQA Officer or CQA Engineer and routed to the project files. CQA Officer or CQA Engineer shall keep a log of field logbooks issued, returned, and completed. Log books shall be completed and maintained in accordance with CONTRACTOR's expectations.

Each page of the field book shall be numbered, dated, and initialed by CQA Personnel. At the start of a new work shift, CQA Personnel shall list the following information at the top of the page:

- Job Name
- Job Number
- Date
- Name
- Weather conditions
- Page number (if pages are not pre-numbered)

The remaining individual entries shall be prefaced by an indication of the time at which they occurred. If the results of test data are being recorded on separate sheets, it shall be noted in the field book.

Entries in the field book shall include but not be limited to the following information:

- Reports on any meetings held and their results;
- Equipment and personnel being used in each location, including subcontractors;
- Descriptions of areas being observed, inspected, and documented;
- Description of materials delivered to the site, including any quality verification (vendor certification) documentation;
- Descriptions of materials incorporated into construction;
- Calibrations, or recalibrations, of test equipment, including actions taken as a result of recalibration;
- Decisions made regarding use of material and/or corrective actions to be taken in instances of substandard quality; and

- Unique identifying sheet numbers of inspection data sheets and/or problem reporting and corrective measures reports used to substantiate the decisions described in the preceding item.

The daily report shall include information of the day's work activities, tests and observations that were made, descriptions of the adequacy of the work performed, and highlight any unresolved issues that must be addressed by the CQA Officer or CQA Personnel the following day. In addition, the daily report shall reference the field book number and page numbers that cover that day's activities. The daily reports shall be submitted to the CONTRACTOR.

The CQA Engineer shall review and initial each daily report before distributing to the project quality records and the CONTRACTOR.

5.2 INSPECTION DATA SHEETS

Observations, results of field and laboratory tests performed on site or off site shall be recorded on an inspection data sheet. At a minimum, each inspection data sheet shall include the following information:

- Unique identifying sheet number for cross-referencing and document control;
- Description of the inspection activity;
- Location of the inspection activity and location from which the sample was obtained;
- Type of inspection activity and/or procedure used (reference to standard method when appropriate);
- Recorded observation or test data, together with necessary calculations;
- Results of the inspection activity (e.g. pass/fail) and comparison with specification requirements;
- Identification of personnel involved in the inspection activity; and
- Signature of the CQA Personnel performing the activity and concurrence by the CQA Officer or CQA Engineer.

5.3 NONCONFORMANCE REPORTING

A nonconformance is considered to be a deficiency in characteristics, documentation, or procedures that renders the quality of an item or activity unacceptable or indeterminate. If a deficiency cannot be repaired or replaced to the satisfaction of CQA Personnel within the guidelines established by this CQAP, then such a deficiency shall be considered a nonconformance and shall be documented in accordance with the CQA Subcontractor's NCR procedure. Nonconforming situations shall be brought to the attention of the CQA Officer and

the CONTRACTOR for concurrence prior to initiation of the NCR. These individuals and others as directed by the CONTRACTOR shall participate in NCR disposition, resolution, and corrective action processes. Documentation relating to NCR situations shall be retained in the project quality.

5.4 DESIGN CHANGES AND CLARIFICATIONS

Requests for changes to the specifications or drawings shall be completed on form(s) provided by the CONTRACTOR. Design changes shall be approved by the CONTRACTOR prior to implementation.

Requests for modifications to the CQAP shall be made by memorandum to the CONTRACTOR with copies to the CQA Officer.

Construction questions or clarifications regarding interpretation of the plans and/or specifications shall be submitted to the CONTRACTOR on forms provided by the CONTRACTOR.

5.5 PROGRESS REPORTS

The CQA Officer shall prepare a summary progress report each week, or at time intervals established at the pre-construction meeting. As a minimum, this report shall include the following information:

- A unique identifying sheet number for cross-referencing and document control;
- The date, project name, location, and other information;
- A summary of work activities accomplished during progress reporting period;
- Identification of areas or items inspected and/or tested during the reporting period that are addressed by the report;
- A summary of the quality characteristics being evaluated, with appropriate cross-references to specifications and/or drawings;
- A summary of inspection and test results, failures, and retests;
- A summary of construction situations, deficiencies, and/or defects occurring during progress reporting period;
- A summary of other problem resolutions and dispositions; and
- The signature of the CQA Officer.

5.6 FINAL DOCUMENTATION

Daily inspection summary reports, field logbooks, inspection sheets, data sheets, problem identification and corrective measures reports, acceptance reports, deviations from design and material specifications (with justifying documentation), DCNs, photographic records, progress reports, drawings, drawing revisions, and other documentation shall be retained as permanent project quality records in compliance with the CQA Subcontractor's QAP. At the completion of the project, a final summary report that incorporates the above information, along with as-built drawings, shall be prepared by the CQA Officer and submitted to the CONTRACTOR. The as-built drawings, which will be generated by a licensed land surveyor licensed in the State of Washington and retained by the SUBCONTRACTOR, shall include scale drawings depicting depths, plan dimensions, elevations, and fill thicknesses. The report shall include documentation of each construction component monitored by CQA Personnel and shall certify that the facility was constructed in accordance with the CQAP, Technical Specifications, and Drawings. The report shall be sealed by a professional engineer registered in the State of Washington.

5.7 STORAGE OF RECORDS

During the construction of ERDF cells, the CQA Officer shall be responsible for CQA documents. This includes the CQA Officer's copy of the design criteria, plans, procedures, and specifications; the CQAP; and the originals of the data sheets and reports. Completed documents shall be routed to the project quality records in compliance with those sections of the CQA Subcontractor's QAP which address project QA records management, including maintenance of a records index, access control, and duplicate records requirements. Working copies shall be retained at the field office to the extent necessary to properly support ongoing activities. Records shall be submitted to the CONTRACTOR in accordance with Exhibit I.

6.0 REFERENCES

ASTM, 2009, *2009 Annual Book of ASTM Standards*, American Society for Testing and Materials, Philadelphia, Pennsylvania

Volume 4.08: Soil and Rock:

- Cl36 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- D422 Standard Test Method for Particle-Size Analysis of Soils
- D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³)
- D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
- D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique

- D1556 Standard Test Method for Density & Unit Weight of Soil in Place by the Sand-Cone Method
- D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-mm³)
- D1603 Standard Test Method for Carbon Black Content in Olefin Plastics
- D1777 Standard Test Method for Thickness of Textile Materials
- D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
- D2216 Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- D2434 Test Method for Permeability of Granular Soils (Constant Head)
- D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D2937 Standard Test Method for Density of Soil in Place by the Drive Cylinder Method
- D4218 Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
- D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- D4491 Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- D4533 Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- D4632 Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
- D4643 Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Heating
- D4716 Standard Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
- D4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile
- D4833 Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

- D5084 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
- D5199 Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
- D5261 Standard Test Method for Measuring Mass per Unit Area of Geotextiles
- D5321 Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
- D5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
- D5641 Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
- D5820 Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
- D5994 Standard Test Method for Measuring Core Thickness of Textured Geomembrane
- D6391 Standard Test Method for Field Measurement of Hydraulic Conductivity Limits of Porous Materials Using Two Stages of Infiltration from a Borehole
- D6392 Standard Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Method
- D6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
- D6938 Standard Test Method for In-Place Density and Water Content of Soil-Aggregate by Nuclear Methods (Shallow Depth)
- D7005 Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
- D7466 Standard Test Method for Measuring the Asperity Height of Textured Geomembrane
- Ecology, 1994, *Dangerous Waste Regulations*, WAC 173-303, Washington State Department of Ecology, Olympia, Washington
- EPA/600/R-93/182 Quality Assurance and Quality Control for Waste Containment Facilities, 2nd Edition, Waste Containment Facilities, ASCE Press, 2007
- EPA, 1994, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, 40 CFR 264, U.S. Environmental Protection Agency, Washington, D.C.

WCH-51, *River Corridor Closure Contract Quality Assurance Program Description*,
Washington Closure Hanford, LLC, Richland, Washington

TABLES

TABLE 4-1. SOIL MINIMUM TESTING REQUIREMENTS
4-1.1 EARTHWORK

Phase	Material	Test and ASTM Number	Frequency
Pre-construction	Backfill	Grain Size Distribution (C136/D422) ⁽¹⁾	1 per 8,000 yd ³
		Atterberg Limits (D4318)	1 per 8,000 yd ³ for soil with > 12% passing the No. 200 sieve
		Modified Proctor Compaction (D1557)	1 per 8,000 yd ³
Construction	Waste Trench Subgrade ⁽²⁾	In-Place Density (D6938)	1 per 10,000 ft ²
	Structural Fill & Waste Trench Embankment ⁽²⁾	In-Place Density (D6938)	1 per 10,000 ft ² per lift
	Below Crest Pad Bldgs ⁽²⁾	In-Place Density (D6938)	2 per lift
	Utility Trench	In-Place Density (D6938)	1 per 300 ft of trench

Notes:

- (1) ASTM C136 shall be used when the amount of material passing the No. 200 sieve is less than 12% by weight. ASTM D422 shall be used when the fine soil fraction is greater than this value
- (2) If ASTM D6938 is used at least one ASTM D1556, ASTM D2937, or ASTM D2167, as well as one ASTM D2216 or ASTM D4643 shall be performed per shift.

4-1.2 ADMIX SOIL LINER

Phase	Material	Test and ASTM Number	Frequency
Pre-construction	Bentonite	Manufacturer's Certificates	1 per 500 tons delivered
	Admix	Recompacted Hydraulic Conductivity (D5084)	1 per 20,000 yd ³
		Standard Proctor (D698)	1 per 20,000 yd ³
		Atterberg Limits (D4318)	1 per 5,000 yd ³
		Natural Moisture Content (D2216)	1 per 1,000 yd ³
		Maximum Clod Size	Periodic Visual Monitoring
		Belt Scale Measurements	1 per 5,000 yd ³
	Base Soil	Particle Size Distribution/Hydrometer (D422)	1 per 10,000 yd ³
USCS Classification (D2487)		1 per 10,000 yd ³	
Test Fill	Admix	Visual Observation	Continuous
		In-Place Moisture-Density (Nuclear, D6938)	6 per lift
		In-Place Moisture-Density (Rubber Balloon, D2167), (Drive Cylinder, D2937) or (Sand Cone, D1556)	1 per lift
		Moisture Content (D2216 or D4643)	1 per day if nuclear gauge is used
		Hydraulic Conductivity (D5084)	1 per lift
		Boutwell (ASTM D6391, Stage 1 - Vertical Hydraulic Conductivity only)	1 per test fill
Construction	Admix	Visual Observations	Continuous
		In-Place Moisture-Density (Nuclear, D6938)	5/acre/lift
		In-Place Moisture-Density (Rubber Balloon, D2167), (Drive Cylinder, D2937) or (Sand Cone, D1556)	1 per day, if nuclear gage is used.
		Shelby Tube for Permeability (D5084)	1 per 5,000 yd ³ , and at least 1 in a corner area
		Moisture Content (D2216 or D4643)	1 per day if nuclear gauge is used

4-1.3. GRAVEL DRAINAGE LAYERS

Phase	Material	Test and ASTM Number	Frequency
Construction	Gravel	Visual Observations	Continuous
		Standard Proctor (ASTM D698) ⁽¹⁾	1 per 10,000 yd ³
		Grain Size Distribution (C136)	1 per 2,000 yd ³
		Permeability (D2434)	1 per 2,000 yd ³
		In-Place Density (ASTM D6938) ⁽¹⁾	1 per 10,000 yd ³

(1) Type C material only.

4-1.4 OPERATIONS LAYER

Phase	Material	Test and ASTM Number	Frequency
Construction		Visual Observations	Continuous
		Standard Proctor (ASTM D698)	1 per 10,000 yd ³
		Grain Size Distribution (D422)	1 per 2,000 yd ³
		In-Place Density (D6938)	1 per 20,000 ft ²

4-1.5 ANCHOR TRENCH/SIDE SLOPE RISER PIPE TRENCH

Phase	Material	Test and ASTM Number	Frequency
Construction	Backfill	Visual Observations	Periodic
		In-Place Density (D6938)	1 per 300 ft of trench
		Grain Size Distribution (D422)	1 per 2,000 yd ³

TABLE 4-2. GEOSYNTHETIC MATERIALS MINIMUM TESTING REQUIREMENTS
4-2.1. HDPE GEOMEMBRANE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Resin	Manufacturer's Documentation Certification and QC Test Results	Every Lot
	Geomembrane	Manufacturing Plant Visit	During Production
		Manufacturer's Documentation, Certification and QC Test Results	Every Roll
Pre-Construction (Before Installing) (Note 1).	Geomembrane	Receiving Inspection	Every Roll
		Specific Gravity (D1505) Carbon Black Content (D1603 or D4218) Asperity Height (D7466) Tear (ASTM D1004) Carbon Black Dispersion (D5596) Thickness (D5199 or D5994) Yield Strength (D6693) Elongation at Yield (D6693) Break Strength (D6693) Elongation at Break (D6693) Puncture Resistance (D4833)	Every 50,000 ft ² per Lot
		Friction Angle (Direct Shear – D5321) admix vs geomembrane	2 Tests Total
		Extrudate	Documentation and Certification
	Installation Surface	Installer's Certification of a Suitable Installation Surface	Each Installation Surface
Construction	Geomembrane	Seam Overlap	Every Panel
		Trial Seams	2 times/day per Welder per Machine
		Vacuum Test (D5641)	All Extrusion or Single Wedge Fusion Welds
		Air Pressure Test (D5820)	All Double Wedge Fusion Welds
		Seam Destructive Test (D6392) (5 peel/5 shear)	Min. Avg. of 1 per 500 ft per Welder

Notes:

1. Testing may be performed prior to shipment from factory.

4-2.2 GEOTEXTILE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geotextile and Thread	Manufacturer's Documentation, Certification, and QC Test Results	Every 50,000 ft ² per Lot
Pre-Construction (Before Installing) (Note 1)	Geotextile	Receiving Inspection	Every Roll
		Mass per Unit Area (D5261) Grab Strength (D4632) Tear Strength (D4533) Puncture Strength (D4833) Thickness (D1777 or D5199) Filter Application Only Permittivity (D4491), Type A only Apparent Opening Size – AOS (D4751), Type A only	Every 50,000 ft ² per Lot

Notes:

1. Testing may be performed prior to shipment from factory

4-2.3. GEOCOMPOSITE

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (After Bonding, but Before Shipping)	Geonet and Geotextile Components	Manufacturer's Documentation, Certification and QC Tests	Every 50,000 ft ² per Lot
		Passing Conformance Test Results for both the Geonet and the Geotextile	
	Geocomposite	Manufacturer's Documentation, Certification and QC Test Results	
Pre-Construction (Note 1)	Geocomposite	Receiving Inspection	Every Roll
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Textured HDPE Liner	2 Tests Total
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Operations Layer	2 Tests Total
		Ply Adhesion (ASTM D7005) Transmissivity (ASTM 4716)	Every 50,000 ft ² per Lot

Notes:

1. Testing may be performed prior to shipment from factory

4-2.4 GEONET

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geonet	Manufacturer's Documentation Certification and QC Tests	Every 50,000 ft ² per Lot
Pre-Construction (Before Installing) (Note 1)	Geonet	Receiving Inspection	Every Roll
		Polymer Specific Gravity (D1505) Thickness (D1777 or D5199) Mass per Unit Area (D5261)	Every 50,000 ft ² per Lot

Notes:

1. Testing may be performed prior to shipment from factory.

TABLE 4-3. ERDF CONSTRUCTION HOLD POINTS

Phase	Activity	Hold Point	Needed to Proceed
Excavation	Subgrade for Liner	Before Covering Subject Portion with Next Layer	Passing CQA density tests
			CQA subgrade survey completed
Soil Liner	Admix Placement	Before Placing in Cell	Passing CQA tests for test fill and stockpiled admix
	Final Surface	Before Covering with HDPE Liner	Passing CQA tests and observation requirements CQA surveys to verify final soil liner thickness
HDPE Liner	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
			Acceptable SUBCONTRACTOR and CQA Friction Angle tests
		Before Covering Subject Portion with Next Layer	CQA review of SUBCONTRACTOR's installation records
			Passing CQA tests
	CQA visual inspection of panels, seams, penetrations, and repairs		
CQA surveys of seams, penetrations, and repairs			
Geotextile	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
		Before covering subject Portion with Next Layer	CQA visual inspection of panels, seams, penetrations, and repairs
Geocomposite	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
			Acceptable SUBCONTRACTOR and CQA Friction Angle tests
		Before Covering Subject Portion with Next Layer	CQA visual inspection of panels, seams, penetrations, and repairs
Drainage Gravel	Installation	Before Covering subject Portion with Next Layer	Passing CQA tests
			CQA surveys to verify layer thickness
Operations Layer	Installation	After Installing	Passing CQA tests
			CQA surveys to verify layer thickness
Piping	Installation	Before Backfilling Trenches	Passing CQA Receipt Inspections
			Passing Pressure and Leak Test Results

EXHIBIT "E"
TECHNICAL SPECIFICATIONS

WASHINGTON CLOSURE HANFORD, LLC
River Corridor Closure Project

ERDF SUPER CELLS 9 & 10 CQA
Subcontract Number: S013213A00

EXHIBIT "E"
TECHNICAL SPECIFICATIONS

WASHINGTON CLOSURE HANFORD, LLC

1. SPECIFICATIONS:

<u>Specification No.</u>	<u>Rev. No.</u>	<u>Date</u>	<u>Title</u>
0600X-SP-A0025	0	11/13/2009	Coatings & Finishes
0600X-SP-C0075	0	11/13/2009	Site Work
0600X-SP-C0076	0	11/13/2009	Cell Construction – Admix Layer
0600X-SP-C0077	0	11/13/2009	Cell Construction – Geosynthetics
0600X-SP-C0078	0	11/13/2009	Cell Construction – Leachate Collection Systems and Lysimeters
0600X-SP-C0079	0	11/13/2009	Reinforced Concrete
0600X-SP-C0080	0	11/13/2009	The Crest Pad Building
0600X-SP-C0081	0	11/13/2009	Metal Structures
0600X-SP-C0082	0	11/13/2009	Lined Bolted Steel Liquid Storage Tanks
0600X-SP-E0025	0	11/13/2009	Electrical Work
0600X-SP-G0048	0	11/13/2009	Quality Control Requirements
0600X-SP-G0050	0	11/13/2009	Construction Equipment
0600X-SP-M0032	0	11/13/2009	Pipe, Valves, & Specials
0600X-SP-M0033	0	11/13/2009	Leachate Pumps
0000X-SP-X0001	3	2/3/09	Subcontractor Prepared Design Drawings

COATINGS AND FINISHES

CONTENTS

1.0	GENERAL.....	4
	1.1 SUMMARY.....	4
	1.2 ABBREVIATIONS.....	4
	1.3 CODES, STANDARDS, LAWS, AND REGULATIONS.....	4
	1.4 TECHNICAL SUBMITTALS.....	5
	1.4.1 Identification Tags.....	5
	1.4.2 Samples.....	5
	1.5 PACKAGING, LABELING, AND STORING.....	5
	1.6 APPROVAL OF COATING MATERIALS.....	6
	1.7 ENVIRONMENTAL CONDITIONS.....	6
	1.8 SAFETY AND HEALTH.....	6
	1.8.1 Worker Exposures.....	6
	1.8.2 Toxic Compounds.....	6
	1.8.3 Training.....	6
	1.8.4 Coordination.....	7
2.0	MATERIALS AND EQUIPMENT.....	7
	2.1 PAINT.....	7
	2.1.1 Colors and Tints.....	7
	2.1.2 Lead.....	7
	2.1.3 Chromium.....	7
	2.1.4 Volatile Organic Compound (VOC) Content.....	7
	2.1.5 Epoxy.....	7
3.0	IDENTIFICATION OF PIPING.....	8
	3.1 GENERAL.....	8
	3.1.1 Labels.....	8
	3.1.2 Lettering.....	8
	3.2 IDENTIFICATION OF VALVES AND SHORT PIPE LENGTHS.....	8
	3.2.1 General.....	8
	3.2.2 Tags.....	8
4.0	EXECUTION.....	8
	4.1 PROTECTION OF AREAS NOT TO BE PAINTED.....	8
	4.2 SURFACE PREPARATION.....	9
	4.2.1 Concrete Surfaces.....	9
	4.2.2 Ferrous Surfaces.....	9
	4.2.3 Nonferrous Metallic Surfaces.....	9
	4.2.4 Plywood Surfaces.....	9
	4.3 MIXING AND THINNING.....	9
	4.3.1 Two-Component Systems.....	10
	4.4 APPLICATION.....	10
	4.4.1 Ventilation.....	10
	4.4.2 Respirators.....	10

4.4.3	First Coat.....	10
4.4.4	Timing.....	10
4.4.5	Fillers	11
4.4.6	Ferrous-Metal Primer.....	11
4.5	SURFACES TO BE PAINTED.....	11
4.6	SURFACES NOT TO BE PAINTED.....	11
4.7	CLEANING.....	11
4.8	PAINTING SCHEDULES.....	11
4.9	IDENTIFICATION DEVICES.....	12
4.9.1	Valve Tags	12
4.9.2	Pipe Identification.....	12
4.9.3	Identification Schedule	13
4.10	CONSTRUCTION QUALITY CONTROL.....	13

COATINGS AND FINISHES

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for Coatings and Finishes.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
FS	Federal Specifications
MSDS	Material Safety Data Sheet
QAP	Quality Assurance Program
SSPC	Steel Structures Painting Council
SSRS	Subcontractor/Supplier Submittal Requirements Summary
VOC	Volatile Organic Compound

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Coatings and Finishes. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Coatings and Finishes. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ACGIH	Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices
ANSI A13.1	American National Standard Scheme for the Identification of Piping Systems
FS TT-E-489	Enamel, Alkyd, Gloss, Low VOC Content
FS TT-E-508	Enamel, Interior Semigloss, Tints and White
FS TT-E-509	Enamel, Odorless, Alkyd, Interior, Semigloss, White and Tints
FS TT-P-96D	Paint, Latex Base, For Exterior Surfaces, Whites and Tints

FS TT-P-645B	Primer, Paint, Zinc-Molybdate, Alkyd Type
SSPC-SP 1	Solvent Cleaning
SSPC-SP 2	Hand Tool Cleaning
SSPC-SP 3	Power Tool Cleaning
SSPC-SP 7	Brush-Off Blast Cleaning

1.4 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I," Subcontractor/Supplier Submittal Requirements Summary (SSRS) Submittals that do not meet requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays

1.4.1 Identification Tags

Provide a list of tags (valves, buildings, etc.) prior to fabrication. A sample of each size and style tag shall be provided with the list.

1.4.2 Samples

Submit samples of the identification devices to be used in the work.

1.5 PACKAGING, LABELING, AND STORING

Paints shall be in sealed containers that legibly show:

- designated name
- formula or specification number
- batch number
- color
- quantity
- date of manufacture
- manufacturer's formulation number
- manufacturer's directions including any warnings and special precautions, and name of manufacturer.

Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinner shall be stored in accordance with the manufacturer's written directions and as a minimum stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors and at temperatures between 40 and 95 degrees F. Paints shall be stored on the project

site or segregated at the source of supply sufficiently in advance of need to allow 30 days for testing.

1.6 APPROVAL OF COATING MATERIALS

Materials will be approved based on test reports furnished with them. If materials are approved based on test reports furnished, samples will be retained by the CONTRACTOR for testing should the materials appear defective during or after application. In addition to any other remedies under the Subcontract the cost of testing defective materials will be at the SUBCONTRACTOR's expense.

1.7 ENVIRONMENTAL CONDITIONS

Unless otherwise recommended by the paint manufacturer, the ambient temperature shall be between 45 and 95 degrees F when applying coatings other than water-thinned, epoxy, and moisture-curing polyurethane coatings. Water-thinned coatings shall be applied only when ambient temperature is between 50 and 90 degrees F. Epoxy shall be applied only within the minimum and maximum temperatures recommended by the coating manufacturer.

1.8 SAFETY AND HEALTH

Work shall comply with applicable Federal laws and regulations, and with the SUBCONTRACTOR's Health and Safety Plan.

1.8.1 Worker Exposures

Exposure of workers to chemical substances shall not exceed limits as established by American Conference of Governmental Industrial Hygienists (ACGIH), threshold limit values (TLV) for chemical substances and physical agents and biological exposure indices (BEI) or as required by a more stringent applicable regulation.

1.8.2 Toxic Compounds

Toxic compounds having ineffective physiological properties, such as odor or irritation levels, shall not be used unless approved by the CONTRACTOR.

1.8.3 Training

Workers having access to an affected work area shall be informed of the contents of the applicable material safety data sheets (MSDS) and shall be informed of potential health and safety hazard and protective controls associated with materials used on the project. An affected work area is one that may receive mists and odors from the painting operations. Workers involved in preparation, painting and clean-up shall be trained in the safe handling, application, and the exposure limit, for each material that will be used in the project. Personnel having a

need to use respirators and masks shall be instructed and trained in the use and maintenance of such equipment.

1.8.4 Coordination

Work shall be coordinated to minimize exposure of other SUBCONTRACTOR personnel and visitors to mists and odors from preparation, painting and clean-up operations.

2.0 MATERIALS AND EQUIPMENT

2.1 PAINT

The term "paint" as used herein includes enamels, paints, epoxy, and other coatings, whether used as prime, intermediate, or finish coat. Paint shall conform to the respective specifications listed for use in the painting schedules at the end of this section.

2.1.1 Colors and Tints

Colors shall be as selected by the CONTRACTOR from manufacturer's standard colors, as indicated. Manufacturer's standard color is for identification of color only. Tinting of paints shall be done by the manufacturer. The color of the undercoats shall vary slightly from the color of the next coat.

2.1.2 Lead

Paints containing lead in excess of 0.06 percent by weight of the total nonvolatile content (calculated as lead metal) shall not be used.

2.1.3 Chromium

Paints containing zinc chromate or strontium chromate pigments shall not be used.

2.1.4 Volatile Organic Compound (VOC) Content

Paints shall comply with applicable state and local laws enacted to insure compliance with Federal Clean Air Standards and shall conform to the restrictions of the local air pollution control authority.

2.1.5 Epoxy

Amerlock 400, or approved equal, manufactured by Ameron.

3.0 IDENTIFICATION OF PIPING

3.1 GENERAL

Identification of exposed pipes shall be accomplished by color-coding with bands and by lettering as specified in this specification. Color bands shall either be painted directly upon the pipe or shall be pressure-sensitive adhesive-backed vinyl cloth or plastic tape.

3.1.1 Labels

Each pipe identification shall consist of 2 color-coded bands, a printed label identifying the name of the pipe, and a flow arrow to indicate direction of flow in the pipe. Labels shall be preprinted on pressure-sensitive adhesive-backed vinyl cloth or plastic tape. Arrows shall be die-cut of the same type of material as the labels. Labels shall be placed on the outside of insulated piping systems.

3.1.2 Lettering

Letter sizes and colors for lettering, arrows, and background shall conform to ANSI A13.1.

3.2 IDENTIFICATION OF VALVES AND SHORT PIPE LENGTHS

3.2.1 General

Identifying devices for valves and the sections of pipe that are too short to be identified with color bands, lettered labels, and arrows shall be identified with metal tags as specified herein.

3.2.2 Tags

Metal tags shall be 16-gauge Type 304 stainless steel metal strips 3/4 inch wide with 3/16-inch high letters stamped on the metal surface. Tags shall be designed to be firmly attached to the valves or short pipes or to the structure immediately adjacent to such valves or short pipes. Tags shall not interfere with equipment operations (i.e. valves, pumps, etc.)

4.0 EXECUTION

4.1 PROTECTION OF AREAS NOT TO BE PAINTED

Items not to be painted which are in contact with or adjacent to painted surfaces shall be removed or protected prior to surface preparation and painting operations. Items removed prior to painting shall be replaced when painting is completed. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Surfaces contaminated by coating materials shall be restored to original condition.

4.2 SURFACE PREPARATION

Surfaces to be painted shall be clean and free of foreign matter before application of paint or surface treatments. Oil and grease shall be removed with clean cloths and cleaning solvents prior to mechanical cleaning. Cleaning solvents shall be of low toxicity with a flashpoint in excess of 100 degrees F. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

4.2.1 Concrete Surfaces

Concrete surfaces shall be allowed to dry at least 30 days before painting, except concrete slab on grade, which shall be allowed to cure 90 days before painting. Glaze, efflorescence, laitance, dirt, grease, oil, asphalt, surface deposits of free iron and other foreign matter shall be removed prior to painting. Surfaces to receive epoxy coatings shall be acid-etched or mechanically abraded as specified by the coating manufacturer, rinsed with water, allowed to dry, and treated with the manufacture's recommended conditioner prior to application of the first coat.

4.2.2 Ferrous Surfaces

Ferrous surfaces, including those that have been shop-coated, shall be solvent-cleaned. Surfaces that contain loose rust, loose mill scale, and other foreign substances shall be cleaned mechanically with hand tools according to SSPC-SP 2, power tools according to SSPC-SP 3 or by sandblasting according to SSPC-SP 7. Shop-coated ferrous surfaces shall be protected from corrosion by treating and touching up corroded areas immediately upon detection.

4.2.3 Nonferrous Metallic Surfaces

Where nonferrous metal surfaces are to be painted, they shall be solvent-cleaned in accordance with SSPC-SP 1.

4.2.4 Plywood Surfaces

Plywood surfaces shall be dry and shall have loose dirt and dust removed by brushing with a soft brush, rubbing with a cloth, or vacuum cleaning prior to application of the first-coat material.

4.3 MIXING AND THINNING

Paints may be thinned in accordance with the manufacturer's directions. The use of thinner shall not relieve the SUBCONTRACTOR from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed local limits on volatile organic compounds. Paints of different manufacturers shall not be mixed.

4.3.1 Two-Component Systems

Two-component systems shall be mixed in accordance with manufacturer's instructions. Any thinning of the first coat to ensure proper penetration and sealing shall be as recommended by the manufacturer for each type of substrate.

4.4 APPLICATION

Painting practices shall comply with applicable state and local laws enacted to insure compliance with Federal Clean Air Standards. Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. At the time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application. Each coat of paint shall be applied so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated. Special attention shall be given to insure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces. Paints, except water-thinned types, shall be applied only to surfaces that are completely free of moisture as determined by sight or touch.

4.4.1 Ventilation

Affected areas shall be ventilated during paint application so that workers exposure to chemical substances shall not exceed limits as established by ACGIH, or as required by a more stringent applicable regulation.

4.4.2 Respirators

Use of respirators shall be directly related to the product used. Final determination as to whether or not respirators must be used will be made by the SUBCONTRACTOR and will be dependent on the toxicity, method of application, and the SUBCONTRACTORS safety plan, job hazard analysis, risk rank analysis, and work package.

4.4.3 First Coat

The first coat on plywood shall include repeated touching up of suction spots or overall application of primer or sealer to produce uniform color and gloss. Excess sealer shall be wiped off after each application.

4.4.4 Timing

Surfaces that have been cleaned, pre-treated, and otherwise prepared for painting shall be given a coat of the specified first coat as soon as practical after such pretreatment has been completed, but prior to any deterioration of the prepared surface. Sufficient time shall elapse between successive coats to permit proper drying. This period shall be modified as necessary to suit

weather conditions. Manufacturer's instructions for application, curing and drying time between coats of two-component systems shall be followed.

4.4.5 Fillers

Concrete surface voids shall be filled with filler material recommended by the paint manufacturer; however, surface irregularities need not be completely filled. The dried filler shall be uniform and free of pinholes. Filler shall not be applied over caulking compound.

4.4.6 Ferrous-Metal Primer

Primer for ferrous-metal shall be applied to ferrous surfaces to receive paint other than asphalt varnish prior to deterioration of the prepared surface. The semitransparent film applied to some pipes and tubing at the mill is not to be considered a shop coat, but shall be overcoated with the specified ferrous-metal primer prior to application of finish coats.

4.5 SURFACES TO BE PAINTED

Surfaces listed in the painting schedules at the end of this section, other than those listed in paragraph SURFACES NOT TO BE PAINTED, shall be painted as scheduled.

4.6 SURFACES NOT TO BE PAINTED

Surfaces of hardware, fittings, and other factory finished items shall not be painted.

4.7 CLEANING

Cloths, cotton waste and other debris that might constitute a fire hazard shall be placed in closed metal containers and removed at the end of each day. Upon completion of the work, staging, scaffolding, and containers shall be removed from the site or destroyed in an approved manner. Paint and other deposits on adjacent surfaces shall be removed and the entire job left clean and acceptable.

4.8 PAINTING SCHEDULES

The following painting schedules identify the surfaces to be painted and prescribe the paint to be used and the number of coats of paint to be applied. SUBCONTRACTOR options are indicated by ---or--- between optional systems or coats.

INTERIOR PAINTING SCHEDULE

<u>Surface</u>	<u>System No.</u>	<u>First Coat</u>	<u>Second Coat</u>	<u>Third Coat</u>
Concrete, floors, pads and curb in Crest Pad Building Meter room	PS-6	Amerlock 400 or equal @ 5-8 mils dry	Amerlock 400 or equal @ 5-8 mils dry	None
Interior wall Surfaces	PS-2	FS TT-P-25E @ 1.6 mil dry	FS TT-P-96 @ 1.6 mil dry	FS TT-P-96 @ 1.6 mil dry
Ferrous metal factory-primed mechanical and electrical equipment	PS-5	FS TT-E-489 @ 2.5 mil dry	FS TT-E-489 @ 2.5 mil dry	None
Ferrous metal	PS-5	FS TT-P-645 @ 2.5 mil dry	FS TT-E-508 ----or---- FS TT-E-509 @ 2.5 mil dry	

4.9 IDENTIFICATION DEVICES

The SUBCONTRACTOR shall furnish, mark, and install identification devices for exposed piping and valves using color bands, lettering, flow direction arrows, and related permanent identification devices, and appurtenant works, in accordance with the requirements of the Subcontract Documents. Labels and identification tags shall be installed in accordance with the manufacturers printed instructions, and shall be neat and uniform in appearance. Tags or labels shall be readily visible from normal working locations.

4.9.1 Valve Tags

Valve tags shall be permanently attached to the valve or structure by means of 2 stainless steel bolts or screws.

The wording on the valve tags shall describe the exact function of each valve, e.g., LE - Tank 1 shut-off.

4.9.2 Pipe Identification

Each pipe shall be identified at intervals of 20 feet, and at least one time in each room. Piping shall also be identified at a point approximately within 2 feet of turns, ells, valves, and on the upstream side of distribution fittings or branches. Sections of pipe that are too short to be identified with color bands, lettered labels, and directional arrows shall be tagged and identified similar to valves.

Pipe identification shall consist of 4 elements, i.e., 2 color bands, a lettered label, and a directional label. The bands shall be arranged so that the lettered label and the directional arrow are placed between the 2 bands.

4.9.3 Identification Schedule

Application of identifying devices shall conform to the following color codes.

Fluid Abbreviation	Function and Identification	Identification Color
LE	Leachate	Yellow/Magenta

4.10 CONSTRUCTION QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Quality Control Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR, or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall submit to CONTRACTOR records of quality control for operations including but not limited to the following:

- (1) Delivery, storage, and handling of devices and equipment used.
- (2) Conformance of materials to the requirements of these specifications.
- (3) Inspection of devices and equipment installed.
- (4) Field testing of devices and equipment.
- (5) Installation of devices and equipment to these requirements and applicable codes and standards.

Records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be submitted to the CONTRACTOR in accordance with Exhibit "T".

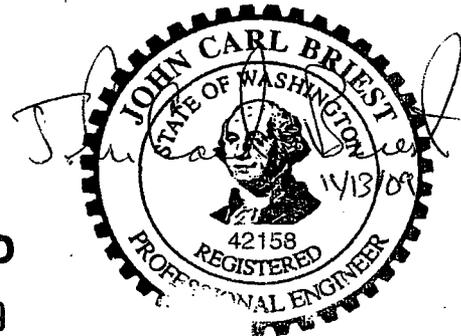
SPECIFICATION FOR

SITE WORK

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)

CELLS 9 & 10 CONSTRUCTION

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP			
1. <input checked="" type="checkbox"/> Work may proceed. 2. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4. <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5. <input type="checkbox"/> Permission to proceed not required.			
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.			
CHECK REVIEW REQUIREMENT	ENVIRONMENTAL RESTORATION	PROJECT REP.	SUBMITTAL
REVIEWED BY	ENVIRONMENTAL	SAFETY	OTHER
W.A. Polansky	[]	[]	[]
Project Engineer/STR	[]	[]	[]
DOCUMENT ID NUMBER	[]	[]	[]
S06X524A00C N03-05-011-002	[]	[]	[]
SC/P.O. No.	[]	[]	[]
SSRS ITEM	[]	[]	[]
SUBMITTAL	[]	[]	[]



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WCH - DOCUMENT CONTROL

Rev	Date	Reason for Revision	Originator	Checker	Project Engineer	HEAD Design Eng.
0	11/13/09	Issued for Award	BJA	NCRD	MK	SCB
Washington Closure Hanford, LLC		RIVER CORRIDOR CLOSURE CONTRACT	Job No. 14655	Specification No. 0600X-SP-C0075		
			Page 1	of 26		

DOCUMENT CONTROL

MJP 11/24/09

SITE WORK

CONTENTS

1.0	GENERAL.....	5
	1.1 SUMMARY.....	5
	1.2 ABBREVIATIONS.....	5
	1.3 CODES, STANDARDS, LAWS, AND REGULATIONS.....	5
	1.4 DEFINITIONS.....	7
	1.4.1 Clearing.....	7
	1.4.2 Grubbing.....	7
	1.4.3 Satisfactory Materials.....	7
	1.4.4 Unsatisfactory Materials.....	7
	1.4.5 Cohesionless and Cohesive Materials.....	7
	1.4.6 Degree of Compaction.....	8
	1.4.7 Unyielding Material.....	8
	1.4.8 Unstable Material.....	8
	1.5 TECHNICAL SUBMITTALS.....	8
	1.5.1 Manufacturer's Literature.....	8
	1.5.2 Field Testing Control.....	8
	1.5.3 Materials Test Reports.....	8
	1.6 SUBSURFACE DATA.....	9
	1.7 CLASSIFICATION OF EXCAVATION.....	9
2.0	MATERIALS AND EQUIPMENT.....	9
	2.1 SELECT BORROW MATERIAL.....	9
	2.2 PLASTIC MARKING TAPE.....	9
	2.3 EROSION CONTROL MATERIALS.....	9
	2.3.1 Fertilizer.....	9
	2.3.2 Seed.....	10
	2.3.3 Mulch.....	10
	2.3.4 Hydromulch.....	10
	2.4 CHAIN LINK FENCE.....	10
	2.4.1 Fabric.....	10
	2.4.2 Posts.....	10
	2.4.3 Braces.....	10
	2.4.4 Accessories.....	11
	2.4.5 Concrete.....	11
	2.5 SELECT GRANULAR MATERIAL.....	11
	2.6 BEDDING AND INITIAL FILL MATERIAL.....	11
	2.7 TYPE I FILL.....	11
	2.8 TYPE II FILL.....	11
	2.9 BASE MATERIAL, CRUSHED SURFACING BASE COURSE (CSBC).....	11
	2.10 SURFACE MATERIAL, CRUSHED SURFACING TOP COURSE (CSTC).....	11
3.0	EXECUTION.....	12
	3.1 GENERAL.....	12

3.2	CLEARING AND GRUBBING.....	12
3.3	EXCAVATION	13
	3.3.1 General.....	13
	3.3.2 Buildings.....	13
	3.3.3 Utilities Systems	14
3.4	PREPARATION OF GROUND SURFACE FOR FILLS AND EMBANKMENTS.....	15
	3.4.1 Structural Fills and Waste Trench Embankments.....	15
	3.4.2 General Fill Areas and Excavation Soil Stockpile Area.....	15
3.5	SUBGRADE PREPARATION FOR BUILDINGS	15
3.6	UTILITY TRENCH BOTTOM PREPARATION	15
3.7	SUBGRADE PREPARATION FOR ROADWAYS	15
	3.7.1 Construction.....	15
	3.7.2 Compaction.....	16
3.8	FILLING AND BACKFILLING FOR BUILDINGS	16
3.9	BACKFILLING AND COMPACTION OF UTILITIES SYSTEMS.....	16
	3.9.1 Trench Backfill	16
3.10	BACKFILL FOR ROADWAYS	17
3.11	FILLS AND EMBANKMENTS	17
	3.11.1 Structural Fills and Waste Trench Embankments.....	17
	3.11.2 General Fills.....	18
	3.11.3 Fill for Anchor Trenches.....	18
	3.11.4 Fill for Termination Berms	18
	3.11.5 Fill for Riser Pipes.....	18
3.12	FINISHING FOR ROADWAYS.....	18
3.13	FINISHED EXCAVATION, FILLS, AND EMBANKMENTS OTHER THAN FOR ROADWAYS AND BUILDINGS	19
3.14	BASE AND SURFACE MATERIAL INSTALLATION.....	19
	3.14.1 Placement and Shaping.....	19
	3.14.2 Compaction.....	19
3.15	STOCKPILES.....	19
3.16	DITCHES AND SWALES	20
3.17	SHORING.....	20
3.18	FIELD TESTING CONTROL.....	20
3.19	SUBGRADE AND EMBANKMENT PROTECTION.....	21
	3.19.1 Tolerance Tests for Roadways.....	21
3.20	SPECIAL REQUIREMENTS	21
	3.20.1 Electrical Distribution System	21
	3.20.2 Plastic Marking Tape	21
	3.20.3 Road Closures	21
3.21	VEGETATIVE EROSION CONTROL	22
	3.21.1 Soil Preparation.....	22
	3.21.2 Method of Application.....	22
	3.21.3 Fertilizer Rate.....	22
	3.21.4 Seed Rate	22

3.21.5	Mulch Rate.....	22
3.21.6	Seed Drill Method.....	23
3.21.7	Broadcast Seed Method.....	23
3.21.8	Polyacrylamide Soil Stabilizer Application.....	23
3.21.9	Time of Seeding.....	23
3.21.10	Watering.....	23
3.22	CHAIN LINK FENCE.....	23
3.22.1	Post Holes.....	24
3.22.2	Posts.....	24
3.22.3	Top Rails.....	24
3.22.4	Braces and Truss Rods.....	24
3.22.5	Tension Wires.....	24
3.22.6	Chain Link Fabric.....	25
3.23	SIGNAGE.....	25
3.23.1	Post Holes.....	25
3.23.2	Posts.....	25
3.23.3	Signs.....	25
3.23.4	Concrete Fill.....	25
3.24	CONSTRUCTION QUALITY CONTROL.....	26

SITE WORK

1.0 GENERAL

1.1 SUMMARY

This specification establishes quality and workmanship requirements for Site Work.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

ASTM	American Society for Testing and Materials
AWS	American Welding Society
CFR	U.S. Code of Federal Regulations
CQC	Construction Quality Control
FS	Federal Specifications
OSHA	Occupational Safety and Health Administration
QAP	Quality Assurance Program
SSRS	Subcontractor/Supplier Submittal Requirement Summary
WSDOT	Washington State Department of Transportation

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Site Work. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Site Work. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

29 CFR 1926	Safety and Health Regulations for Construction
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C117	Standard Test Method for Materials Finer than 75-um (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

ASTM D75/D75M	Standard Practice for Sampling Aggregates
ASTM D422	Standard Test Method for Particle Size Analysis of Soils
ASTM D1140	Standard Test Methods for Amount of Material in Soils Finer than the No. 200 (75-um) Sieve
ASTM D1556	Standard Test method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2,700 kN-m/m ³))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM F883	Standard Performance Specification for Padlocks
ASTM F1043	Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
AWS WZC	Welding Zinc-Coated Steel
FS RR-F-191/1E	Fencing, Wire and Post, Metal (Chain-Link Fence Fabric)
FS RR-F-191/2E	Fencing, Wire and Post, Metal (Chain-Link Fence Gates)
FS RR-F-191/3E	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)

FS RR-F-191/4F	Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)
FS RR-F-191/GEN	Fencing, Wire and Post, Metal (Chain-Link Fence Fabric, and Accessories)
WAC 173 216	State Waste Discharge Permit Program
WAC 173 400	General Regulations for Air Pollution Sources
WSDOT 9-03.9(3)	Crushed Surfacing
WSDOT M41-10	Standard Specifications for Road, Bridge, and Municipal Construction

1.4 DEFINITIONS

1.4.1 Clearing

Clearing shall consist of shredding vegetation within the limits of construction. It shall also include the satisfactory disposal of the cleared material and other rubbish from areas that are to be grubbed.

1.4.2 Grubbing

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated areas.

1.4.3 Satisfactory Materials

Materials classified in ASTM D2487 as GW, GP, GM, GW-GM, SW, SP, SM, SP-SM and SW-SM and free from roots and other organic matter, trash, debris, and frozen materials.

1.4.4 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials and materials classified in ASTM D2487 as Pt, OH, and OL are unsatisfactory. Unsatisfactory materials also include man-made fills, refuse, or backfills from previous construction.

1.4.5 Cohesionless and Cohesive Materials

Cohesionless materials include materials classified in ASTM D2487 as GW, GP, SW, and SP.

Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

Testing required for classifying materials shall be in accordance with ASTM D4318 (for admix and excavation fill soils containing >12% fines passing the #200 sieve), ASTM C136, ASTM D422, and ASTM D1140.

1.4.6 Degree of Compaction

Degree of compaction is a percentage of the maximum density relative to the Modified Proctor (ASTM D1557), abbreviated hereinafter as a percent of maximum density.

1.4.7 Unyielding Material

Unyielding material shall consist of rock and gravelly soils with stones greater than 3 inches in any dimension or as defined by the pipe manufacturer, whichever is smaller.

1.4.8 Unstable Material

Unstable material shall consist of materials too wet or too soft to properly support the materials to be placed on or above it.

1.5 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.5.1 Manufacturer's Literature

Manufacturer's descriptive data, catalog cuts, literature and other data as necessary to fully describe that materials comply with specified requirements.

1.5.2 Field Testing Control

Qualifications of the commercial testing laboratory, procedures, personnel, etc. performing testing in accordance with paragraph FIELD TESTING CONTROL and Construction Quality Requirements, Specification No. 0600X-SP-G0048.

1.5.3 Materials Test Reports

Certified test reports and analysis certifying materials conform to the specified requirements, and for tests conducted in accordance with paragraph FIELD TESTING CONTROL and Construction Quality Requirements, Specification No. 0600X-SP-G0048. Provide copies of laboratory and field test reports within 1 working day of the completion of the test.

1.6 SUBSURFACE DATA

Subsurface soil boring logs are shown on previous cell construction drawings. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.7 CLASSIFICATION OF EXCAVATION

No consideration will be given to the nature of the materials, and excavation will be designated as unclassified excavation.

2.0 MATERIALS AND EQUIPMENT

2.1 SELECT BORROW MATERIAL

Borrow material shall be selected from material excavated under this Subcontract and shall meet the requirements and conditions of the particular fill for which it is to be used.

2.2 PLASTIC MARKING TAPE

Plastic marking tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in TABLE 1 and shall bear a continuous printed inscription describing the specific utility. Tape shall be a minimum of 3 inches in width.

Red:	Electric
Blue:	Water Systems
Purple:	Leachate
Yellow:	Transfer Line

2.3 EROSION CONTROL MATERIALS

2.3.1 Fertilizer

Fertilizer to be applied shall be a commercial, chemical type, uniform in composition, free flowing, conforming to State and Federal laws suitable for application with a grain seed drill. Fertilizer shall have a guaranteed analysis showing not less than 16 percent nitrogen, 16 percent available phosphate, and 16 percent water-soluble potash.

2.3.2 Seed

Seed shall be delivered to job site in original unopened packages bearing content tags. Seed shall be guaranteed 95 percent pure live seed with a minimum germination rate of 85 percent. Seed shall be crested wheatgrass, variety Hycrest (*Agropyron cristatum x desertorum*), Sherman's Big Bluegrass (*Poa ampla*), and Bluebunch Wheatgrass variety Secar (*Agropyron spicatum*).

2.3.3 Mulch

Straw mulch shall be applied after drill or broadcast seeding. Mulch shall be grass straw, free from noxious weeds. The straw shall be capable of being applied over the seedbed using a mulcher or straw spreader pulled by a tractor.

2.3.4 Hydromulch

Hydromulch shall be a wood fiber based mulch.

2.4 CHAIN LINK FENCE

2.4.1 Fabric

FS RR-F-191/1E, Type I, zinc-coated steel wire with minimum coating weight of 1.2 ounces of zinc per square foot of coated surface, or Type II, aluminum-coated steel wire. Fabric shall be fabricated of 11-gauge wire woven in 2-inch mesh. Fabric height shall be 6 feet for perimeter fence, and 8 feet for collection fence. Fabric shall be twisted and barbed on the top and bottom selvages.

2.4.2 Posts

FS RR-F-191/3E, zinc-coated; Class 1 Grade A or B, steel pipe; Class 3, formed steel sections; Class 6, steel square sections; or DQ-40 galvanized steel pipe. Class 4, steel H-section may be used for line posts in lieu of line post shapes specified for the other classes. Sizes shall be as shown on the drawings. Line posts and terminal (corner, gate, and pull) posts selected shall be of the same class throughout the fence. Gatepost shall be either round or square, subject to the limitation specified in FS RR-F-191/3E.

2.4.3 Braces

FS RR-F-191/3E, zinc-coated, Class 1, Grade A or B, steel pipe, size SP1. Class 3, formed steel sections, size FS1, conforming to FS RR-F-191/3E, may be used as braces if Class 3 line posts are furnished.

2.4.4 Accessories

FS RR-F-191/4F. Ferrous accessories shall be zinc or aluminum coated. Truss rods shall be furnished for each terminal post. Truss rods shall be provided with turnbuckles or other equivalent provisions for adjustment. Tie wire for attaching fabric to rails, braces, and posts shall be 9-gauge steel wire.

2.4.5 Concrete

ASTM C94, using 3/4-inch maximum size aggregate, and having minimum compressive strength of 2500 psi at 28 days. Grout shall consist of one part portland cement to three parts clean, well-graded sand and the minimum amount of water to produce a workable mix.

2.5 SELECT GRANULAR MATERIAL

Select granular material shall consist of well-graded sand, gravel, crushed gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall contain not more than 10 percent by weight of material passing a No. 200 mesh sieve and no less than 95 percent by weight passing the 1-inch sieve.

2.6 BEDDING AND INITIAL FILL MATERIAL

Bedding and initial backfill for utilities shall consist of select granular material. The maximum allowable aggregate size shall be not more than 1 inch per foot of pipe diameter, 3 inch maximum, or the maximum size recommended by the pipe manufacturer, whichever is smaller.

2.7 TYPE I FILL

Type I fill shall consist of satisfactory materials with a maximum particle size of 6 inches.

2.8 TYPE II FILL

Type II fill shall consist of satisfactory materials with a maximum particle size of 1-inch.

2.9 BASE MATERIAL, CRUSHED SURFACING BASE COURSE (CSBC)

Base material and crushed surfacing base course (CSBC) shall be 1.25 inch minus crushed Base Course in accordance with the requirements of WSDOT 9-03.9(3).

2.10 SURFACE MATERIAL, CRUSHED SURFACING TOP COURSE (CSTC)

Surface material and crushed surfacing top course (CSTC) shall be 0.75 inch crushed Top Course and Keystone in accordance with the requirements of WSDOT 9-03.9(3).

3.0 EXECUTION

3.1 GENERAL

Areas within the limits of construction shall be cleared and grubbed unless otherwise noted. The SUBCONTRACTOR shall survey and locate the limits of clearing and grubbing prior to initiating clearing and grubbing activities. Areas within the Cells 9 & 10 Stockpile Area shown on Drawing No. 0600X-DD-C0301 do not have to be grubbed prior to placement of stockpiled soil, unless base soil is excavated from the stockpile area.

Excavations shall be performed in accordance with the requirements of 29 CFR 1926, Subpart P, Exhibit "G," Subcontractor Safety and Health Requirements and Exhibit "E," Technical Specifications. The SUBCONTRACTOR's OSHA competent person for excavations shall maintain daily records of excavation observations and be responsible for implementing corrective actions for potentially unsafe conditions based upon physical observations noted and other conditions in the field. SUBCONTRACTOR shall submit the names and qualifications of OSHA competent persons for excavations. No excavation work shall take place if a competent person is not onsite.

The SUBCONTRACTOR shall protect existing structures and embankments. Any structure or buried utilities damaged during clearing and grubbing operations shall be reported to the CONTRACTOR and shall be replaced or repaired by the SUBCONTRACTOR at no additional cost to the CONTRACTOR.

Entry and exit points into excavations shall be marked and maintained. Ramps utilized for entry shall be maintained free of slip and trip hazards.

Equipment operating near excavations shall be operated at a distance from the banks of the excavation to support the weight of the equipment, but in no instance closer than 2 feet. SUBCONTRACTOR shall prevent cave-ins, equipment turn over, etc.

3.2 CLEARING AND GRUBBING

Vegetation shall be cleared by using a "brush-hog," or similar equipment, to cut, chip, and size reduce the organic material to chips and slash that will be removed from excavation area surface. Vegetation shall be cut down to within 6 inches of the ground surface. Clearing shall also include the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work. This includes, but is not limited to, loose rocks, boulders, and rock piles. Loose rocks, boulders, and rock piles shall be removed and disposed of in a location designated by the CONTRACTOR. Cleared and grubbed material shall be removed and disposed of in the unsatisfactory materials stockpile.

In areas to be grubbed, material shall be removed to a depth of not less than 12 inches below the original ground surface. Cleared material and other rubbish shall be removed and the remaining

soil shall be stockpiled according to the soil's classification as described in "Definitions" of the specification.

3.3 EXCAVATION

3.3.1 General

Excavation of every description, regardless of material encountered shall be performed to the lines, grades, and elevations shown on the drawings and specified herein. Material required for fills shall be obtained from cell excavation or stockpiles if approved by CONTRACTOR. Satisfactory excavation material shall be transported to and placed in fill areas such as embankment, subgrades, shoulders, and other similar fills within the limits of the work or disposed of in the stockpile area shown on the drawings. Excavation below indicated depths shall not be permitted except to remove unsatisfactory material. In the event that unsatisfactory material is encountered below the grades shown or specified, the CONTRACTOR shall be notified. Determination of elevations and measurements of approved over depth excavation of unsatisfactory material and the replacement of such material with satisfactory material shall be done under the direction of the CONTRACTOR.

Excavations below the depths indicated, without specific directions, shall, except as otherwise specified, be refilled and compacted in accordance with Section 3.11 of 0600X-SP-C0075 to the proper grade with the appropriate type of material at no additional cost to the CONTRACTOR. Excavation and filling shall be performed in a manner and sequence that will provide drainage. Excavations shall be kept free from water while construction therein is in progress. Surface water shall be directed away from excavation and construction sites so as to prevent erosion and undermining of foundations. Diversion ditches, dikes, pumping, and grading shall be provided and maintained by the SUBCONTRACTOR as necessary during construction. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Vertical excavation slopes shall not be left overnight, weekends, or holidays. CONTRACTOR approval is required to barricade vertical slopes in lieu of dressing.

SUBCONTRACTOR may construct additional access ramps to facilitate excavation of the cell. SUBCONTRACTOR's access ramps located on the north and south side slopes shall be removed to the lines and grades shown on the Drawings in Exhibit "F". CONTRACTOR may elect to keep SUBCONTRACTOR's access ramp(s) located on the east side slope. SUBCONTRACTOR's access ramps located on the east side slope shall be removed as directed by the CONTRACTOR. The access ramp located on the east slope shown on the Drawings in Exhibit "F" shall be constructed to the lines and grades shown on the Drawings.

3.3.2 Buildings

Excavation for buildings shall include trenching for utility systems to a point 5 feet beyond the building line of each building and structure. Excavation shall extend a sufficient distance from walls and footings to allow for placing and removal of forms. Where excavations for footings are carried below the depths indicated without prior approval, the concrete footings shall be

increased in thickness to the bottom of the over depth excavations and additional reinforcement included therein as determined necessary by the CONTRACTOR at the SUBCONTRACTORS expense.

3.3.3 Utilities Systems

During excavation, material satisfactory for backfilling utility systems shall be stockpiled in an orderly manner in accordance with OSHA 29 CFR 1926 trenching and shoring requirement at a distance from the banks of the trench equal to 1/2 the depth of the excavation, but in no instance closer than 2 feet.

3.3.3.1 Utility Trench Excavation. The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below the top of the pipe shall be vertical and at a width recommended in the manufacturers installation manual. Trench walls more than 4 feet high shall be shored, cut back to a stable slope, or provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Trench walls which are cut back shall be excavated to meet the requirements of 29 CFR 1926. Special attention shall be given to slopes that may be adversely affected by weather or moisture content. The trench width below the top of pipe shall not exceed 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter. Where recommended trench widths are exceeded, redesign, stronger pipe, or special installation procedures shall be utilized by the SUBCONTRACTOR. The cost of redesign, stronger pipe, or special installation procedures shall be borne by the SUBCONTRACTOR without any additional cost to the CONTRACTOR.

3.3.3.2 Removal of Unyielding Material. Where unyielding material is encountered in the bottom of the trench, such material shall be removed a minimum 4 inches below the required grade and replaced with bedding and initial backfill material as provided in Section 3.9, BACKFILLING AND COMPACTION OF UTILITIES SYSTEMS.

3.3.3.3 Removal of Unstable Material. Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed by the CONTRACTOR and replaced to the proper grade with bedding and initial backfill material as provided in Section 3.9, BACKFILLING AND COMPACTION OF UTILITIES SYSTEMS. When removal of unstable material is required due to the fault or neglect of the SUBCONTRACTOR, the resulting material shall be excavated and replaced by the SUBCONTRACTOR without additional cost to the CONTRACTOR.

3.3.3.4 Excavation for Appurtenances. Excavation for precast manholes or similar structures shall be sufficient to leave at least 12 inches clear between the outer structure surfaces and the face of the excavation or support members.

3.4 PREPARATION OF GROUND SURFACE FOR FILLS AND EMBANKMENTS

3.4.1 Structural Fills and Waste Trench Embankments

Ground surface on which structural fill is to be placed shall be stripped of live, dead, or decayed vegetation, rubbish, debris, and other unsatisfactory material to a depth of 12 inches. Ground surface shall be plowed, disked, or otherwise broken up; pulverized; moistened or aerated as necessary; thoroughly mixed; and compacted to not less than 95 percent of maximum density as determined by ASTM D1557. The prepared ground surface shall be scarified and moistened or aerated as required just prior to placement of embankment materials to assure adequate bond between embankment material and the prepared ground surface.

3.4.2 General Fill Areas and Excavation Soil Stockpile Area

Ground surface on which general fill and excavation soil stockpile is to be placed shall be cleared.

3.5 SUBGRADE PREPARATION FOR BUILDINGS

The surface shall be scarified to a depth of 6 inches and shall be compacted to not less than 95 percent of maximum dry density as determined by ASTM D1557 prior to placing fill or backfill. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Approved compacted subgrades that are disturbed by the SUBCONTRACTOR's operations or adverse weather shall be scarified and recompacted as specified to the required density prior to further construction. Recomposition over underground utilities shall be by hand tamping, except for concrete encased duct banks.

3.6 UTILITY TRENCH BOTTOM PREPARATION

The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe or conduit. The pipe trench bottom shall be given a final trim, using a string line or laser for establishing grade, such that each pipe section when first laid will be continually in contact with the ground along the extreme bottom of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing.

3.7 SUBGRADE PREPARATION FOR ROADWAYS

3.7.1 Construction

Subgrade shall be Type I material which is shaped to line, grade, and cross section, and compacted as specified. This operation shall include plowing, diskings, and any moistening or aerating required to obtain the specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with Type I material or other approved material as directed. Low

areas resulting from removal of unsatisfactory material shall be brought up to required grade with Type I materials, and the entire subgrade shall be shaped to line, grade, and cross section and compacted as specified. The elevation of the finished subgrade shall not vary more than 0.1 feet from the established grade and cross section.

3.7.2 Compaction

Subgrade shall be moisture conditioned and compacted to at least 90 percent maximum density as determined by ASTM D1557 for a depth of 12 inches.

3.8 FILLING AND BACKFILLING FOR BUILDINGS

Type I fill shall be used in bringing fills and backfills to the lines and grades indicated and for replacing unsatisfactory materials. Type I fill shall be placed in horizontal layers not exceeding 8 inches in loose thickness, or 6 inches when hand-operated compactors are used. After placing, each layer shall be plowed, disked or otherwise broken up, moistened or aerated as necessary, thoroughly mixed and compacted as specified. Backfilling shall not begin until construction below finish grade has been approved by CONTRACTOR, underground utilities systems have been inspected, tested and approved by CONTRACTOR, forms removed, and the excavation cleaned of trash and debris. Backfill shall be brought to indicated finish grade. Backfill shall not be placed in wet or frozen areas. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation than a distance equal to the height of backfill above the top of footing. The area remaining shall be compacted in layers not more than 4 inches in compacted thickness with power-driven hand tampers suitable for the material being compacted. Backfill shall not be placed against foundation walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall. Each layer of fill and backfill shall be compacted to not less than 95 percent of maximum dry density as determined by ASTM D1557.

3.9 BACKFILLING AND COMPACTION OF UTILITIES SYSTEMS

Backfill material shall consist of bedding and initial backfill material or Type I fill as required by the Drawings and these specifications. Backfill shall be placed in layers not exceeding 6 inches loose thickness for compaction by hand operated machine compactors, and 8 inches loose thickness for other than hand operated machines. Each layer shall be compacted to at least 90 percent maximum dry density (ASTM D1557), unless otherwise specified for backfill of roadways and buildings.

3.9.1 Trench Backfill

Trenches shall be backfilled to the grade shown. The trench shall be backfilled to 2 feet above the top of pipe prior to performing the required pressure tests. The joints and couplings shall be left uncovered during the pressure test.

3.9.1.1 Replacement of Unyielding Material. Unyielding material removed from the bottom of the trench shall be replaced with bedding and initial backfill material.

3.9.1.2 Replacement of Unstable Material. Unstable material removed from the bottom of the trench or excavation shall be replaced with bedding and initial backfill material placed in layers not exceeding 6 inches loose thickness.

3.9.1.3 Bedding and Initial Backfill. Bedding and initial backfill material shall be placed and compacted by hand-held tamping bars to a height of at least one foot above the top of utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe.

Bedding and initial material shall be provided for sewers, drainage pipelines, and other gravity flow pipelines.

After compacting the bedding, the SUBCONTRACTOR shall perform a final trim using a string line (or laser) for establishing grade, such that the extreme bottom of each pipe section is continually in contact with the bedding. Excavation for pipe bells and welding shall be made as required.

3.9.1.4 Final Backfill. The remainder of the trench, except for special materials for roadways, shall be filled with Type I fill. Backfill material shall be placed and compacted as required for the general area surrounding the utility trench.

3.10 BACKFILL FOR ROADWAYS

Compaction requirements for backfill materials shall also conform to the applicable portions of paragraphs SUBGRADE PREPARATION FOR ROADWAYS. Additionally, the material shall be placed in successive horizontal layers of 8 inches in loose depth for the full width of the cross section.

3.11 FILLS AND EMBANKMENTS

3.11.1 Structural Fills and Waste Trench Embankments

Fills and embankments shall be constructed at the locations and lines and grades indicated. The completed fill shall conform to the shape of the typical sections indicated or shall meet the requirements of the particular case. Type I fill shall be used unless otherwise specified. No frozen material shall be permitted in the fill. Stones having a dimension greater than 4 inches shall not be permitted in the upper 6 inches of fills or embankments. Material in the top five feet shall be placed in successive horizontal layers not to exceed 6 inches in loose depth for the full width of the cross section and shall be compacted to at least 95 percent maximum dry density as determined by ASTM D1557. Material below the top five feet shall be placed in successive horizontal layers not to exceed 12 inches in loose depth for the full width of the cross section and

shall be compacted to at least 90 percent maximum dry density as determined by ASTM D1557. Each layer shall be compacted and tested before the overlaying lift is placed. Moisture content of the fill or backfill material shall be adjusted by wetting or aerating to provide the moisture content required to obtain the specified percent of maximum dry density as determined by ASTM D1557.

3.11.2 General Fills

General fill areas are limited to the areas identified on the Drawings. Type I fill shall be used to bring the general fill areas to the lines and grades indicated. The material shall be placed in lifts not to exceed 8 inches in loose depth and shall be compacted to 90 percent of maximum dry density.

3.11.3 Fill for Anchor Trenches

Fill material for anchor trenches shall consist of Type II fill material. Fill shall be placed in lifts not to exceed 6 inches in loose depth and compacted by a hand held mechanical or rubber tired compaction equipment, or other as approved by CONTRACTOR. Finished backfill shall be adequately sloped and drained to prevent ponding of water or softening of fill and adjacent soils.

3.11.4 Fill for Termination Berms

Type I fill shall be used for the termination berms and the termination protective soils. Fill shall be placed in lifts not to exceed 36 inches in compacted depth and tracked with grading equipment. The fill shall be sufficiently wetted to eliminate soft pockets of dry material, and the surface compacted to 90 percent of the maximum dry density as determined by ASTM D1557.

3.11.5 Fill for Riser Pipes

Type II fill shall be used for the fill around the sump riser pipes, sump level transducer pipes, and lysimeter access pipe. Fill shall be placed in lifts not to exceed 8 inches in loose depth and compacted to 90 percent of the maximum dry density as determined by ASTM D1557. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe. Care shall also be taken that the underlying pipes and geosynthetics are protected in accordance with the paragraph titled MATERIALS IN CONTACT WITH GEOMEMBRANES OR GEOCOMPOSITES in Specification No. 0600X-SP-C0078.

3.12 FINISHING FOR ROADWAYS

Roadway and shoulder surfaces shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish shall be within 0.1 feet of the grades and elevations indicated on Drawings.

3.13 FINISHED EXCAVATION, FILLS, AND EMBANKMENTS OTHER THAN FOR ROADWAYS AND BUILDINGS

Areas covered by the limits of construction on the Drawings including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations, but not more than 0.15 feet above or below the established grade and approved cross section, except as otherwise specified. Ditches and swales shall be finished to allow effective drainage and erosion control.

3.14 BASE AND SURFACE MATERIAL INSTALLATION

The surface on which the base and surface materials is placed, shall conform to the Subcontract requirements, and shall be approved by the CONTRACTOR before placement of base materials. No base or surface material shall be placed on snow, soft, muddy, or frozen subgrade.

3.14.1 Placement and Shaping

The SUBCONTRACTOR shall provide a homogeneous mixture of unsegregated and uniformly dispersed materials in position for compacting in layers not to exceed 8 inches of compacted material. During placement and compaction, the moisture content of the material shall be maintained at the highest level practical for the material without causing free water to drain through the material and build up on lower courses or on the subgrade. The SUBCONTRACTOR shall apply frequent light applications of water rather than heavy applications of water to provide the necessary moisture.

3.14.2 Compaction

Immediately following spreading and final shaping, the full depth of each layer shall be compacted to a minimum of 95 percent of maximum dry density as established by ASTM D1557 before the next succeeding layer is placed.

3.15 STOCKPILES

SUBCONTRACTOR shall submit for approval a stockpile plan complete with procedures for stockpiling and maintaining excavated soil material. Stockpiles shall be kept in a neat and well-drained condition, giving due consideration to drainage. The ground surface at stockpile locations shall be sealed by rubber-tired equipment. Stockpile of satisfactory materials shall be protected from contamination that may destroy the quality and fitness of the stockpiled material. If the SUBCONTRACTOR fails to protect the stockpile, and any material becomes unsatisfactory, such material shall be removed at no additional cost to the CONTRACTOR.

SUBCONTRACTOR shall maintain a separate stockpile for Eolian base soil. Eolian base soils shall not be mixed with other soils.

3.16 DITCHES AND SWALES

Ditches and swales shall be cut accurately to the cross sections and grades indicated. Roots, stumps, rock, and foreign matter in the sides and bottom of ditches and channel changes shall be trimmed and dressed or removed to conform to the slope, grade, and shape of the section indicated. Care shall be taken not to excavate ditches below the grades indicated. Excessive ditch and swale excavation shall be backfilled to grade with Type I material, thoroughly compacted. Ditches and swales excavated under this section shall be maintained until final acceptance of the work.

3.17 SHORING

Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable requirements of 29 CFR 1926 Subpart P. Shoring, including sheet piling, shall be furnished and installed as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Shoring, bracing, and sheeting shall be removed as excavations are backfilled, in a manner to prevent cave-ins.

3.18 FIELD TESTING CONTROL

Testing is the responsibility of the SUBCONTRACTOR. Tests shall be performed by an approved commercial testing laboratory or may be tested by facilities furnished by the SUBCONTRACTOR. No work requiring testing shall be performed until the facilities, procedures, construction quality control plan, etc. have been inspected and approved by the CONTRACTOR. The SUBCONTRACTOR, or subtiers shall provide copies of nuclear gauge licenses, calibrations, procedures, and training certificates for operators.

When ASTM D6938 is used for field in-place density testing, the calibration curves shall be checked, and adjusted if necessary, using the sand cone (ASTM D1556) or drive cylinder (ASTM D2937) methods. ASTM D6938 results in a wet unit weight of soil and shall also be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D6938. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed by the CONTRACTOR.

Copies of calibration curves, results of calibration tests, and field and laboratory density tests shall be furnished to the CONTRACTOR. When test results indicate, as determined by the CONTRACTOR, that compaction is not as specified, the material shall be removed, replaced and recompacted to meet specification requirements, at no additional expense to the CONTRACTOR. Tests on recompacted areas shall be performed to determine conformance with specification requirements.

Testing requirements can be found in Specification No. 0600X-SP-G0048, Section 2.11-MINIMUM TESTING REQUIREMENTS. If there are discrepancies between this specification and Specification No. 0600X-SP-G0048, the more stringent requirements shall be followed.

3.19 SUBGRADE AND EMBANKMENT PROTECTION

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained to drain effectively. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the SUBCONTRACTOR in a satisfactory condition until pavement is placed. The storage or stockpiling of materials on the finished subgrade shall not be permitted. Areas within 5 feet outside of each building and structure line shall be constructed true-to-grade, shaped to drain, and shall be maintained free of trash and debris until final inspection has been completed and the work has been accepted.

3.19.1 Tolerance Tests for Roadways

Continuous checks on the degree of finish specified in Section 3.7 SUBGRADE PREPARATION FOR ROADWAYS shall be made during construction of the subgrades and as specified in Section 3.12 FINISHING FOR ROADWAYS for placement of base materials on roadway surface.

3.20 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.20.1 Electrical Distribution System

Direct burial cable and conduit or duct line shall have a minimum cover of 24 inches from the finished grade, unless otherwise indicated.

3.20.2 Plastic Marking Tape

Warning tapes shall be installed directly above the buried utility (pipe, conduit, direct buried cable, etc.), at a depth of 18 inches below finished grade unless otherwise shown.

3.20.3 Road Closures

Trench excavations crossing roads, or any other construction activity which may impede vehicle traffic flow, shall be limited to the hours of 8:00 am to 3:00 pm, and 6:00 pm to 6:00 am, Monday through Friday. There are no time restrictions on weekends. The SUBCONTRACTOR shall maintain one lane of traffic open or provide alternate temporary roadways during construction activities on or near roadways. Trenches that cross existing roads shall be

backfilled prior to rush hour traffic ingress or egress. Cuts through paved roads shall be asphalted within 48 hours of backfilling.

3.21 VEGETATIVE EROSION CONTROL

The SUBCONTRACTOR shall provide erosion protection including fertilizing, seeding, and mulching for areas that are disturbed including slopes equal to or greater than 4H:1V and in the bottom of drainage ditches and swales and the material in the stockpile area. Application of vegetative erosion control for the stockpile area shall be either by drill or Broadcast seed method on surfaces permitting safe tractor operation. Surfaces too steep for safe tractor operation shall be hydrosseeded. No vegetative control is required on the interior sloping walls or bottoms of Cells.

SUBCONTRACTOR shall coordinate transportation and use of fertilizer with CONTRACTOR.

SUBCONTRACTOR will not be allowed to store fertilizer on-site overnight. Additionally SUBCONTRACTOR shall coordinate with CONTRACTOR for additional required on-site Hanford Security Procedures.

3.21.1 Soil Preparation

The soil to be seeded shall be graded in conformance with the Drawings and shall be loose and reasonably free of large rocks and other material(s) that may interfere with successful seeding.

3.21.2 Method of Application

Fertilizer and seed shall be applied using a range or grain drill or broadcast seeder. Straw shall be applied by a mulcher designed to apply this material on surfaces safe for tractor operation.

3.21.3 Fertilizer Rate

Fertilizer application shall be approximately 120 lb/acre.

3.21.4 Seed Rate

The seed and seeding rate are as follows: Crested Wheatgrass Hycrest variety (*Agropyron desertorum*) 10 lb/acre, Sherman's Big Bluegrass (*Poa ampla*) 5 lb/acre, and Bluebunch Wheatgrass variety Secar (*Agropyron spicatum*) 5 lb/acre of seed.

3.21.5 Mulch Rate

Straw mulch shall be applied at rate to cover the soil surface 2 to 4 inches deep or use of a standard up to approximately 4000 lb/acre, upon the completion of drill or broadcast seeding. Straw mulch shall be crimped into place to prevent wind erosion.

Wood fiber mulch shall be applied at 2000 lb/acre after the seed and fertilizer. The wood fiber mulch and polyacrylamide soil stabilizer shall be distributed with a hydroseeder on steep soil surfaces after the seed and fertilizer have been applied.

3.21.6 Seed Drill Method

The seed application consists of using a grain or range drill to apply both seed and fertilizer concurrently. The seed drill shall be pulled using a 4-wheel drive tractor to ensure even seeding on steeper slopes. The seed shall be placed between 0.25 to 0.50 inches deep in the soil by the seed drill at rates specified in Sections 3.21.3 and 3.21.4.

3.21.7 Broadcast Seed Method

Broadcast seeding shall evenly distribute the seeds and fertilizer as specified in Sections 3.21.3 and 3.21.4. Upon the completion of broadcast seeding, a tractor pulled cultipacker shall be pulled over the entire seeded area.

3.21.8 Polyacrylamide Soil Stabilizer Application

A polyacrylamide soil stabilizer shall be evenly applied over the seeded areas at a rate of 15 lbs/acre and activated with 3000 gallons of water per acre.

3.21.9 Time of Seeding

Seeding shall not be started until after application of all earthwork and site grading. Polyacrylamide soil stabilizer may be applied prior to seeding to minimize soil erosion upon the completion of construction activities. Seeding shall be performed in December through January or as approved by CONTRACTOR. The SUBCONTRACTOR shall return to the site after completion of the project if the project schedule does not allow for a fall planting prior to the project completion date.

3.21.10 Watering

The SUBCONTRACTOR shall provide dust control during seeding operations by water truck or irrigation to prevent visible dust. Irrigation of the seedbed after polyacrylamide application will be required to activate the soil stabilizer product. Amount of irrigation shall be determined per manufacturer's recommendation. Additional irrigation after seeding and mulching will only be necessary to control visible dust. Care shall be taken to avoid excessive washing or puddling on the surface and any such damage caused thereby shall be repaired by the SUBCONTRACTOR at no additional cost to the CONTRACTOR.

3.22 CHAIN LINK FENCE

Fence shall be installed to the lines and grades indicated on design drawings. Line posts shall be spaced equidistant at intervals not exceeding 10 feet. Terminal (corner, gate, and pull) posts shall

be set at abrupt changes in vertical and horizontal alignment. Fabric shall be continuous between terminal posts; however, runs between terminal posts shall not exceed 500 feet. Damage to the galvanized surface due to welding shall be repaired with "repair sticks" of zinc-cadmium alloys or zinc-tin-lead alloys per AWS WZC.

3.22.1 Post Holes.

Postholes shall be cleared of loose material. Waste material shall be spread where directed by the CONTRACTOR. The ground surface irregularities along the fence line shall be eliminated to the extent necessary to maintain 2 inches clearance between the bottom of the fabric and finish grade.

3.22.2 Posts

Posts shall be set plumb and in alignment. Posts shall be set in concrete to the depth indicated on the drawings. Posts set in concrete shall be set in holes not less than the diameter shown on the drawings. Concrete and grout shall be thoroughly consolidated around each post, shall be free of voids and finished to form a dome. Concrete and grout shall be allowed to cure for 72 hours prior to attachment of any item to the posts. Fence post rigidity shall meet the following requirement. When a 50-pound force is applied on the post, perpendicular to the fabric, at 5 feet above ground, post movement measured at the point where the force is applied shall be less than or equal to 3/4 inches from the relaxed position.

3.22.3 Top Rails

Top rails are not required for this project. Top tension wire shall be installed in place of top rails.

3.22.4 Braces and Truss Rods

Braces and truss rods shall be installed as indicated and in conformance with the standard practice for the fence furnished. Braces and truss rods shall extend from terminal posts to line posts. Diagonal braces shall form an angle of approximately 40 to 50 degrees with the horizontal.

3.22.5 Tension Wires

Tension wires shall be installed along the top and bottom of the fence line and attached to the terminal posts of each stretch of the fence. Top tension wires shall be installed within the top 4 inches of the installed fabric. Bottom tension wire shall be installed within the bottom 6 inches of the installed fabric. Tension wire shall be pulled taut and shall be free of sag.

3.22.6 Chain Link Fabric

Chain link fabric shall be installed on the side of the post indicated. Fabric shall be attached to terminal posts with stretcher bars and tension bands. Bands shall be spaced at approximately 15 inch intervals. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Fabric shall be fastened to line posts at approximately 15 inch intervals and fastened to tension wires at approximately 24 inch intervals. Fabric shall be cut by untwisting and removing pickets.

Splicing shall be accomplished by weaving a single picket into the ends of the rolls to be joined. The bottom of the installed fabric shall be 2 inches (plus or minus 1/2 in.) above the ground. Chain link fabric shall meet the following requirement. After being exercised by applying a 50-pound, push-pull force at the center of the fabric between the posts, the use of a 30-pound pull at the center of the panel shall cause fabric deflection of not more than 2.5 inches when pulling fabric from the post side of the fence.

3.23 SIGNAGE

Signage shall meet all requirements for layout and color as specified by DOE. Requirements can be obtained from CONTRACTOR. Typeface on all signage shall be Helvetica.

3.23.1 Post Holes

Posts holes shall not be less than the diameter shown on the drawings. Waste material shall be spread where directed by the Contractor. Prior to placement of posts, holes should be inspected to ensure it is clear of loose material and rubbish.

3.23.2 Posts

Posts shall be set plumb and in alignment. Posts shall be set in concrete to the depth indicated on the drawings.

3.23.3 Signs

Signs shall be fabricated and fastened according to their respective details on drawing 0600X-DD-CO263.

3.23.4 Concrete Fill

ASTM C94, using 3/4 inch maximum size aggregate, and having minimum compressive strength of 2500 psi at 28 days. Concrete shall be thoroughly consolidated around each post, shall be free of voids and finished to form a dome.

3.24 CONSTRUCTION QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall maintain and submit to CONTRACTOR records including but not limited to the following:

- (1) Excavation and backfill to lines and grades indicated.
- (2) Field moisture and density tests.
- (3) Methods and procedures for providing drainage away from excavations.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be supplied to the CONTRACTOR within one working day of the inspection or test.

CELL CONSTRUCTION – ADMIX LAYER

CONTENTS

1.0	GENERAL.....	4
1.1	SUMMARY.....	4
1.2	ABBREVIATIONS.....	4
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS.....	4
1.4	TECHNICAL SUBMITTALS.....	6
	1.4.1 Manufacturer's Data.....	6
	1.4.3 Admix Liner Placement Plan.....	6
	1.4.4 Quality Control Certification.....	6
1.5	DESCRIPTION.....	7
2.0	MATERIALS AND EQUIPMENT.....	7
2.1	BENTONITE FOR THE ADMIX LAYER.....	7
2.2	BASE SOIL FOR THE ADMIX LAYER.....	7
2.3	ADMIX LAYER MATERIALS.....	8
	2.3.1 Properties.....	8
	2.3.2 Composition.....	8
	2.3.3 Testing.....	8
3.0	EXECUTION.....	9
3.1	GENERAL.....	9
	3.1.1 Unacceptable Materials and Work.....	9
3.2	ADMIX MANUFACTURE.....	9
	3.2.1 Equipment.....	9
	3.2.2 Personnel Qualifications.....	9
	3.2.3 Base Soil Excavation and Stockpiling.....	10
	3.2.4 Manufacture Requirements.....	10
	3.2.5 Admix Manufacture Plan.....	10
3.3	TEST FILL.....	10
3.4	SUBGRADE PREPARATION.....	12
	3.4.1 General Requirements.....	12
	3.4.2 Compaction - Trench Floor.....	13
	3.4.3 Compaction - Trench Side Slopes.....	13
	3.4.4 Subgrade Fill.....	13
3.5	ADMIX PLACEMENT AND COMPACTION.....	13
	3.5.1 Lift Thickness.....	14
	3.5.2 Compaction.....	14
	3.5.3 Permeability.....	16
	3.5.4 Uniformity.....	16
	3.5.5 Moisture Conditioning.....	16
	3.5.6 Placement Equipment.....	16
	3.5.7 Placement Method.....	16
	3.5.8 Restrictions.....	17

3.5.9 Tie-in Areas17

3.6 ADMIX SURFACE FINISHING, PROTECTION, AND MAINTENANCE 17

3.6.1 Maintenance and Freeze Protection.....17

3.6.2 Repair of Admix Liner.....18

3.6.3 Admix Liner Surface Preparation.....18

3.7 CONSTRUCTION QUALITY CONTROL..... 19

CELL CONSTRUCTION – ADMIX LAYER

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for the Admix Layer of the liner for the Environmental Restoration Disposal Facility (ERDF).

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
CQA	Construction Quality Assurance
CQC	Construction Quality Control
CQAP	Construction Quality Assurance Plan
EPA	Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
HDPE	High Density Polyethylene
QAP	Quality Assurance Plan
SSRS	Subcontractor Submittal Requirements Summary
USCS	Unified Soil Classification System

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Cell Construction. Referenced test methods, specifications, and recommended practices shall be used to verify material properties and to identify acceptable practices applicable to Cell Construction. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

API Spec13A	Specification for Drilling-Fluid Materials.
ASTM D422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

ASTM D1140	Standard Test Methods for Amount of Material in Soils Finer than the No. 200 (75mm) Sieve
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2,700 kNm/m ³))
ASTM D2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating
ASTM D5084	Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
ASTM D5321	Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
ASTM D5890	Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners
ASTM D5891	Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners
ASTM D6391	Standard Test Method for Field Measurement of Hydraulic Conductivity Limits of Porous Materials Using Two Stages of Infiltration from a Borehole
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil-Aggregate by Nuclear Method (Shallow Depth)
EPA/600/R-93/182	Quality Assurance and Quality Control for Waste Containment Facilities*
WAC 173 216	State Waste Discharge Permit Program

WAC 173 400 General Regulations for Air Pollution Sources

- * Note that an update to EPA/600/R-93/182 has been published: Daniel, D.E. and Koerner, R. M. (2007). *Waste Containment Facilities: Guidance for Construction Quality Assurance and Construction Quality Control of Liner and Cover Systems*, second ed., ASCE, New York, NY, 351 pp.

1.4 TECHNICAL SUBMITTALS

Submittals shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor Submittal Requirements Summary (SSRS). Submittals that do not meet requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.4.1 Manufacturer's Data

Manufacturer's descriptive data, specification sheets, literature, and other data necessary to fully demonstrate compliance with the requirements of these specifications.

1.4.2 Admix Preparation Plan

The SUBCONTRACTOR shall submit a detailed plan for preparation of the admix material, including a description of the equipment, calibrations, tests, and procedures to be used; personnel qualifications; hold points; site plan showing pugmill plant and stockpile locations; bentonite storage equipment and procedures; productivity rates; stockpile maintenance procedures; test fill plan; and methods for monitoring bentonite addition and moisture conditioning. The Admix Preparation Plan shall be approved by the CONTRACTOR prior to the start of admix production for the test pad and cell liners.

1.4.3 Admix Liner Placement Plan

The SUBCONTRACTOR shall submit an Admix Liner Placement Plan to specify placement equipment and methods, lift thickness control, admix layer maintenance, finished surface protection, hold points, haul routes, productivity rates, survey and/or GPS records, repair procedures, freeze protection procedures for placed admix that does not have overlying liner system and operations layer, required testing described in the Construction Quality Control (CQC) Plan and CQAP for this project. This Admix Liner Placement Plan shall be approved by the CONTRACTOR prior to the start of admix placement for the Test Fill or Trench Liner.

1.4.4 Quality Control Certification

Certifications for material composition and properties, Construction Quality Control CQC tests, admix surface, equipment calibration, and other work activities as described in these specifications.

1.5 DESCRIPTION

This section includes the work for furnishing, preparing, handling, installing, and finishing/trimming the Admix layer.

Admix consists of soil that is mixed with bentonite, moisture conditioned, placed, compacted, and trimmed to form the soil liner for the ERDF.

2.0 MATERIALS AND EQUIPMENT

2.1 BENTONITE FOR THE ADMIX LAYER

The bentonite used in the admix shall consist of a commercially prepared material meeting the requirements of API Specification 13A, Section 9, with a minimum yield of 91 barrels. The bentonite shall have a free swell of 15 ml per 2 gm or greater (ASTM D5890) and a maximum Fluid Loss of 15ml (ASTM D5891). Acceptable products shall have been used in similar applications.

The SUBCONTRACTOR shall submit manufacturer's information and test data to demonstrate that the proposed bentonite conforms to the requirements of these specifications. The Manufacturer shall certify that the bentonite furnished complies with these specifications. A certificate shall be submitted to the CONTRACTOR for each 500 tons of bentonite delivered.

The SUBCONTRACTOR shall provide suitable containers on site to store bentonite in a dry condition prior to use. SUBCONTRACTOR shall perform inspections of storage containers to ensure proper condition is maintained during storage.

2.2 BASE SOIL FOR THE ADMIX LAYER

The base soil for the admix layer shall consist of soil derived from the ERDF excavation having a USCS Classification SM, SW, SC, MH, ML in accordance with ASTM D2487, or other soil approved by the CONTRACTOR. The base soil shall be obtained from soils excavated during construction and placed in a dedicated stockpile constructed for this purpose. Material from other stockpiles shall not be used without approval of the CONTRACTOR. The base soil shall be free of roots, woody vegetation, frozen material, rubbish, and other deleterious material. No rocks greater than 2 inches in dimension will be allowed in the admix liner. Base soil shall have 20 percent minimum passing No. 200 U.S. Sieve. Base soil shall be classified and screened if necessary to meet this requirement.

To ensure the quantity of base soil required to construct the admix layer is available; the SUBCONTRACTOR shall excavate and stockpile base soil prior to stockpiling excess soil in the stockpile area shown on the Exhibit "F" Drawings.

2.3 ADMIX LAYER MATERIALS

2.3.1 Properties

The properties of the admix when mixed uniformly and placed according to the specifications, shall have a maximum saturated hydraulic conductivity of 1×10^{-7} cm/sec and have a USCS classification of ML, CL, CH, or SC.

The finished admix shall have the following properties:

Fraction passing the U.S. No. 200 sieve (ASTM D1140):	>30%
Liquid Limit (ASTM D4318):	>30
Plasticity Index (ASTM D4318):	>15

For evaluating compliance with these requirements, test results shall be considered acceptable when the average value of the data satisfies the associated criterion.

2.3.2 Composition

The admix shall consist of the base soil mixed with a nominal bentonite content of 12 percent by dry weight. The acceptable range for bentonite content shall be a minimum of 11 percent and maximum of 14 percent of base soil by dry weight. The admix shall be prepared at a moisture content that ranges from approximately 12 to 19 percent. The moisture content range may change as a result of preconstruction testing performed by the SUBCONTRACTOR and CONTRACTOR as described in the CQC and CQAP Plans, and may be modified by the CONTRACTOR at any time during the admix preparation process to reflect changes in the base soil or other components. The moisture content and bentonite dispersion in the admix shall be uniform and homogenous. The finished admix shall be a uniform homogenous material. SUBCONTRACTOR shall maintain records available to the CONTRACTOR verifying these requirements are maintained.

2.3.3 Testing

The admix shall be prepared and tested by the SUBCONTRACTOR in accordance with the CQC Plan. The SUBCONTRACTOR shall make the admix stockpiles and liner available to the CQA SUBCONTRACTOR and CONTRACTOR for sampling, testing, or visual observation.

3.0 EXECUTION

3.1 GENERAL

3.1.1 Unacceptable Materials and Work

Materials and work that fail to meet the requirements of these specifications shall be removed and disposed of at the SUBCONTRACTOR's expense.

3.2 ADMIX MANUFACTURE

The SUBCONTRACTOR shall provide necessary equipment and labor to operate the pugmill, load material into pugmill, offload admix, and stockpile admix.

3.2.1 Equipment

Admix shall be prepared using a pugmill with the following characteristics and ancillary equipment:

- a. Continuous mixing pugmill.
- b. Belt scales on base soil, bentonite, and finished product belts.
- c. Feed rate meters and totalizers for bentonite, base soil, and water.
- d. Production rate meters and totalizers for finished product.
- e. Equipment shall be capable of production rates to meet schedule requirements.
- f. Equipment shall be readily repairable (e.g. not experience downtime periods greater than 48 hours, repair parts are available).

Measuring equipment shall be calibrated and calibration certificates submitted to the CONTRACTOR prior to starting admix production.

3.2.2 Personnel Qualifications

The pugmill operator shall have completed three similar projects with a minimum of 50,000 tons/30,000 cubic yards of acceptable amended soil on each project. Submit evidence to demonstrate the qualifications of the pugmill operator.

3.2.3 Base Soil Excavation and Stockpiling

During excavation and stockpiling, base soil liner materials shall be inspected to document compliance with the requirements of the specifications. Material inspection shall continue throughout the liner construction period. Visual observation and classification of the excavated base soils used in admix production shall be performed. Unsuitable material shall be rejected. For borrow areas containing non-uniform materials, unacceptable soil material shall be segregated as it is excavated. SUBCONTRACTOR shall observe segregation operations carefully and continuously to document that only suitable base soil material is retained for liner construction. Changes in color or texture may be indicative of a change in soil type or soil moisture content.

3.2.4 Manufacture Requirements

Admix shall be manufactured at least 12 hours prior to placement in the landfill. The SUBCONTRACTOR shall be responsible for maintaining and sealing the stockpiled material to protect the moisture content of the admix within the specified limits. Admix that does not meet specifications shall not be reused as feed stock unless approved by the CONTRACTOR.

3.2.5 Admix Manufacture Plan

The SUBCONTRACTOR shall submit a detailed plan for manufacture of the admix material, including a description of the equipment and procedures to be used, proposed production rate, records to be maintained, start-up plan that includes a demonstration that the proposed production rates can be consistently achieved, personnel qualifications, and methods for monitoring bentonite and base soil addition and moisture conditioning. This plan shall be approved by the CONTRACTOR prior to the start of admix production.

3.3 TEST FILL

A test fill shall be constructed by the SUBCONTRACTOR to demonstrate the adequacy of the materials, design, equipment, and construction procedures proposed for the admix liner. The primary purpose of the test fill is to document that the specified soil density, moisture content, and permeability values can be achieved consistently in the full-scale facility with the full-scale compaction equipment and procedures. The location of the test fill will be designated by the CONTRACTOR. Testing shall be conducted by the SUBCONTRACTOR. CONTRACTOR or others may also conduct testing.

So that the test fill will accurately represent the performance of the full-scale facility, the following requirements shall be followed:

- Construction of the test fill shall use the same soil material, design specifications, equipment, and procedures as proposed for the full-scale facility.

- The test fill shall be constructed at least four times wider than the widest piece of construction equipment to be used for the full-scale facility. This is done to ensure a sufficient area to conduct testing after a buffer area has been left along the edges of the test fill.
- The test fill shall be long enough to allow construction equipment to achieve normal operating speed before reaching the area that will be used for testing.
- The test fill shall be constructed with at least six lifts to evaluate the methodology used to tie lifts together.
- The test fill shall be constructed to allow determination of the relationship among density, moisture content, and permeability. Field variables can affect this relationship and shall be carefully measured and controlled both in the test fill and during construction of the full-scale liner. As a minimum, the following shall be observed, sampled, tested, and documented by the SUBCONTRACTOR:
 - the compaction equipment type, configuration, length of peg foot, and weight
 - the number of passes of the compaction equipment
 - the method used to breakdown clods before compaction and the maximum allowable clod size
 - the method used to control and adjust moisture content, including time to equilibrate and the quantity of water to be used in any adjustment
 - the speed of the compaction equipment traveling over the liner
 - the uncompacted and compacted lift thicknesses
 - types of rutting (depths, widths, etc.)
- SUBCONTRACTOR shall assist the CQA Subcontractor in collecting Shelby tubes for laboratory hydraulic conductivity tests (ASTM D5084).
- Following collection of hydraulic conductivity samples, the methodology for repairing holes in the soil liner shall be evaluated. The evaluation of a repaired area shall include all tests previously required for undisturbed portions of the test fill. The methods and materials that will be used in the repair process shall be documented by the SUBCONTRACTOR. Performance of repaired soil liner sections shall be equal to or exceed the performance of undisturbed liner sections. The resulting procedures shall be followed during repair of testing or sampling holes during full-scale liner construction.

- The test fill construction shall include the removal and replacement of a portion of the soil liner to evaluate the method proposed for repair of defective portions of the full-scale liner.
- The CQA Subcontractor will conduct a two-stage borehole infiltration test (ASTM D6391) on the test fill to evaluate large-scale permeability. The CQA Subcontractor will furnish the test equipment.
- SUBCONTRACTOR shall assist the CQA Subcontractor to evaluate layer bonding by excavating test pits so CQA Subcontractor can make visual observations. A minimum of two test pits shall be excavated in each test fill after test fill construction has been completed. The test pits shall be excavated entirely through the test fill using a backhoe, posthole digger, or other approved method. Test pit locations shall be determined by the CONTRACTOR and CQA Subcontractor.

No soil liner shall be placed within the cell limits until the test fill has been constructed and the results from tests, including the two-stage borehole infiltration test, indicate that the admix will satisfy the permeability requirements specified in this section. The duration of the two-stage borehole tests is expected to last 2 to 3 weeks. Additional test fills shall be constructed for each borrow source and whenever significant changes occur in the liner material, equipment, or procedures used to construct the full-scale soil liner. Changes to the admix preparation procedures after acceptance of test pad does not automatically require a new test fill, but a new test fill may be required if the final admix product varies significantly in properties and composition. Installing replacement components in the pugmill or replacing a defective pugmill with a like-kind replacement would likely not require a new test fill. Conversely, if there was a change in the properties of the bentonite, base soil, or finished admix product, a new test fill shall be required. If the additional test fill is required because of changes in the equipment or procedures initiated by the SUBCONTRACTOR, the SUBCONTRACTOR shall reimburse CONTRACTOR for the CQA SUBCONTRACTOR and surveying costs associated with the new test fill.

After testing has been completed and approved, the admix can be used by the SUBCONTRACTOR for liner construction provided that the material satisfies the requirements of these specifications.

3.4 SUBGRADE PREPARATION

3.4.1 General Requirements

The surface of the subgrade shall be graded to lines, grades, and tolerances shown on the Drawings. The subgrade surface shall be rolled flat and shall be smooth and free of ruts. Admix shall not be placed on frozen subgrade soils or ponded water. The subgrade shall be tested by the SUBCONTRACTOR as described in the CQC Plan.

3.4.2 Compaction - Trench Floor

On the trench floor, the top 8 inches of the excavated subgrade surface shall be scarified with a disc and re-compacted to 90 percent of the maximum dry density as determined by the Modified Proctor (ASTM D1557).

3.4.3 Compaction - Trench Side Slopes

On the side slopes of the trench, the following procedure shall be used to prepare the subgrade for placement of admix:

1. Windrows or piles of loose material produced by trimming operations shall be removed.
2. The trimmed surface shall be watered so that moisture penetrates a minimum of 4 inches into the subgrade. Care shall be exercised during watering so that the subgrade is not disturbed and rills, gullies, and other erosional features are prevented.
3. The trimmed and watered surface shall be track walked by dozer to produce a firm and stable subgrade.
4. Visual monitoring of the subgrade preparation on sideslopes shall be performed by the CONTRACTOR.

3.4.4 Subgrade Fill

In locations on the sideslope where less than 8 inches of fill is required to reach the subgrade design grade, suitable moisture-conditioned fill material shall be placed and compacted as described in Section 3.4.3. For purpose of this section, "suitable fill material" is defined as materials classified in ASTM D2487 as GW, GP, GM, GW-GM, SW, SP, SM, SP-SM and SW-SM and free from roots and other organic matter, trash, debris, and frozen materials.

In locations on the trench floor or locations on the sideslope where more than 8 inches of fill is required to reach the design grade, subgrade shall be placed, compacted, and tested in accordance with the requirements for Fills and Embankments specified in the Technical Specification for Site Work, 0600X-SP-C0075.

3.5 ADMIX PLACEMENT AND COMPACTION

Manufacture of admix material for the liner system shall not begin until testing on the test fill is complete, including the two-stage borehole infiltration test, and the CQA Subcontractor's tests on the test fill indicate that the SUBCONTRACTOR's materials, equipment, and construction procedures will provide an admix liner meeting the specified requirements.

3.5.1 Lift Thickness

The admix material shall be placed in maximum 8 inches thick loose lifts and compacted such that the compacted lift thickness is 6 inches or less. However, the first lift of admix placed over subgrade soils may be placed in a 10 to 12 inch thick loose lift thickness and compacted to a maximum thickness of 8 inches. SUBCONTRACTOR shall use laser or GPS guidance to maintain proper lift thickness on all spreading equipment. Clods greater than 3 inches shall be broken down prior to compaction.

Placement methods shall prevent excessive mixing of admix with subgrade soil. If in the judgment of the CONTRACTOR, excessive mixing occurs that could compromise the integrity of the liner, the unacceptable admix shall be removed, the subgrade recompacted and prepared in accordance with these specifications, and new admix placed. The new admix shall be subject to the same restrictions on excessive mixing with the subgrade.

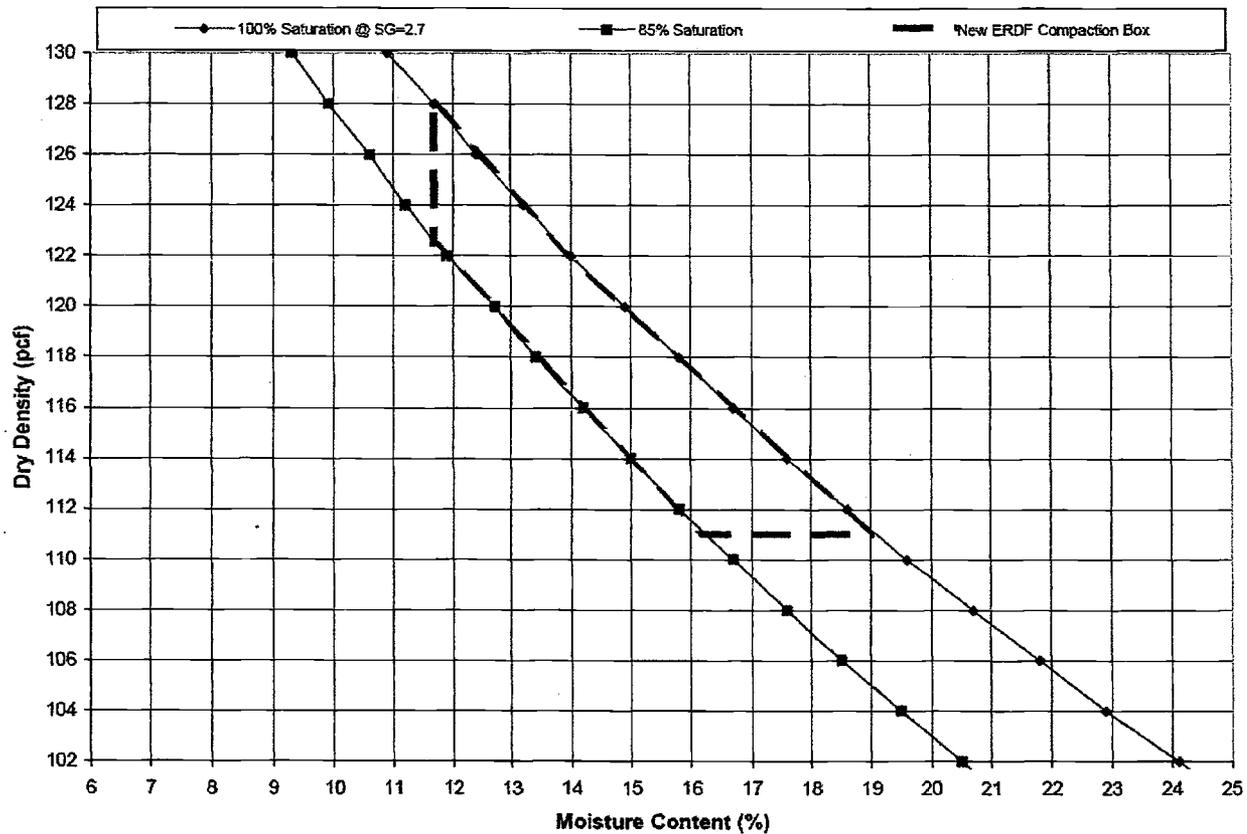
3.5.2 Compaction

Compaction equipment used on the full-scale liner shall be the same type, configuration, and weight as used in the test fill. The equipment speed and number of passes for compaction shall be the same as used in the test fill. Coverage by compaction equipment shall be uniform; special attention shall be paid to compacted fill edges, in equipment turnaround areas, and at the tops and bottoms of slopes.

The admix shall be compacted to a dry density that corresponds to at least 85 percent saturation assuming a specific gravity of 2.7. The moisture-density range of the compacted admix shall lie within a trapezoidal-shaped field with the following corners:

Moisture Content (%)	Dry Density (pcf)
11.7	128.0
11.7	122.5
16.2	111.0
19.0	111.0

ERDF CELLS 9 AND 10 ADMIX "ACCEPTABLE ZONE"



The corner values of this acceptable field may be modified using the method given in the EPA Technical Guidance Document (EPA/600/R-93/182) based on actual field values developed by the SUBCONTRACTOR at any time during admix preparation or placement to reflect changes in the base soil or other components.

Sufficient liner strength to maintain stable sidewalls and to supply a stable base for supporting overlying materials shall be maintained while achieving the minimum specified density. This shall be monitored by the SUBCONTRACTOR with moisture-density testing in accordance with the procedures listed in the CQA Plan.

Penetrations or holes resulting from the collection of undisturbed soil samples or the use of density or moisture probes shall be repaired using the same materials and methods used for repairs on the test fill. SUBCONTRACTOR shall repair holes resulting from sampling or testing activities.

3.5.3 Permeability

The in-place compacted admix liner shall achieve a saturated hydraulic conductivity of 1×10^{-7} cm/sec or less (ASTM D5084).

3.5.4 Uniformity

The compacted admix distribution and gradation throughout the liner shall be free from lenses, pockets, streaks, layers, or material differing substantially in texture, moisture content, dry density, or gradation from surrounding material. The admix shall be free of organic debris, frozen material, rubbish, construction debris, 2 inch rocks and other deleterious material. Any admix containing unacceptable material shall be removed and discarded.

3.5.5 Moisture Conditioning

The moisture content of the admix shall be uniform throughout each lift prior to and during compaction of the material. If the moisture content of a lift of compacted admix falls below the acceptable limit during placement operations, the SUBCONTRACTOR shall moisture condition the dry soil and recompact the lift prior to placement of additional lifts. If the moisture content of a layer of compacted admix exceeds the acceptable limit due to precipitation or over watering, the SUBCONTRACTOR, before placement of additional lifts, shall either allow the wet soil to dry back within acceptable limits or remove the wet soil. If the admix cannot be conditioned to meet the placement specifications, the material shall be removed and replaced with new admix material.

3.5.6 Placement Equipment

The SUBCONTRACTOR shall place layers of admix to form a continuous monolithic liner. Admix shall be placed and compacted with a self-propelled pegfoot or padfoot roller compactor having a minimum operating weight of 40,000 pounds or CONTRACTOR approved equal. Hauling and spreading equipment will not be considered as compaction equipment. The compactor feet shall be sufficiently long to knead (bond) new lifts into previously placed lifts. The feet shall be kept free of large amounts of dried admix that might restrict foot penetration or become incorporated into the admix lift. If necessary to promote bonding of subsequent lifts, the top of each lift shall be scarified with suitable equipment such as a disc, and wetted prior to placing the next lift. The final lift of admix may be compacted with a smooth drum roller after it has been compacted with the pegfoot compactor provided that other requirements are met.

3.5.7 Placement Method

Admix shall be placed on the side slopes in either horizontal lifts (along the contour) or in lifts parallel to the slope (up and down the slope). If admix is placed parallel to the slope, compaction equipment shall not spin their wheels or in any other way disturb the previously placed lifts. If this occurs, the SUBCONTRACTOR shall place the admix in horizontal lifts.

Side slopes shall be overbuilt to protect the admix from excessive drying. Admix placed on the floor shall be placed in a method that will prevent ponding of water and excessive drying between lifts.

3.5.8 Restrictions

Production, mixing, and stockpiling of admix shall be restricted to the construction limits shown on the Drawings and will not be allowed within the landfill footprint.

3.5.9 Tie-in Areas

Where new admix is tied-in to existing admix liner, any areas of the existing admix which are soft, cracked, or otherwise unsuitable shall be removed until acceptable material is exposed to the satisfaction of the CONTRACTOR. The edge of the existing admix shall be trimmed to the configuration indicated on the drawings. Where new admix will be placed, the surface of the existing admix shall be scarified and moisture conditioned as specified in this section. New admix shall be placed in accordance with the requirements of this specification and shall be thoroughly mixed into the existing admix to form a monolithic mass free of seams or other discontinuities.

3.6 ADMIX SURFACE FINISHING, PROTECTION, AND MAINTENANCE

The surface of the admix shall be trimmed just prior to geomembrane deployment to the design grades and tolerances as shown on the Drawings. The surface shall be graded such that the design grades are achieved throughout the trench, not just at survey grid points. The surface of the admix shall be rolled with a smooth-drum roller to remove ridges and surface irregularities. Ruts on the surface of the admix liner that are deeper than 1 inch and desiccation cracks or other cracks that are deeper than 1 inch or wider than 0.25 inch shall be repaired by the SUBCONTRACTOR prior to placement of the geomembrane.

3.6.1 Maintenance and Freeze Protection

The SUBCONTRACTOR shall maintain the admix liner surface in a condition suitable for geomembrane installation until the surface is covered. This may be accomplished by periodic watering, exclusion of traffic, or other methods.

The SUBCONTRACTOR shall take measures to prevent the admix liner from freezing. Admix liner that will be not covered with the overlying liner system and operations layer during the time period November 15 to March 1 shall be protected from freezing using a method (e.g. construct additional lifts prior to freezing and then removing the additional lifts after, etc.) approved by the CONTRACTOR. Lifts of admix shall not be placed on frozen surfaces. In the event that the admix surface freezes before geomembrane is placed, the CONTRACTOR may direct additional evaluation of admix properties by the SUBCONTRACTOR. Geomembrane shall not be placed on a surface which is frozen or has been frozen and thawed until directed by the CONTRACTOR.

3.6.2 Repair of Admix Liner

The SUBCONTRACTOR shall repair the surface of any areas identified by the SUBCONTRACTOR, CONTRACTOR, or CQA SUBCONTRACTOR to be out of tolerance. Repair as follows:

- a. Remove admix that does not meet specifications.
- b. Scarify surface and spray with water.
- c. Place additional approved admix.
- d. Compact admix with self-propelled pegfoot or padfoot type compactor as described above.
- e. Trim and roll the surface as described above to design grades and tolerances.

Alternative methods for repair of the admix liner will be allowed if submitted by the SUBCONTRACTOR and approved by the CONTRACTOR. Minor rills, gulleys, ruts, or other local anomalies that are less than 2 inches deep and 4 inches wide, may be repaired by backfilling with admix liner and hand-tamping with a suitable device to firmly compact the backfill.

SUBCONTRACTOR personnel shall repair small holes resulting from CONTRACTOR sampling, SUBCONTRACTOR sampling and other CQC activities. The CQA SUBCONTRACTOR shall repair sampling holes caused by the CQA SUBCONTRACTOR. Holes less than or equal to 6 inches in diameter shall be repaired by backfilling with bentonite or admix liner in lifts no more than 2 inches thick and hand-tamping with a steel rod or other suitable device to firmly compact each lift.

3.6.3 Admix Liner Surface Preparation

The SUBCONTRACTOR shall be responsible for preparing the surface of the admix liner according to the Specifications. Surfaces to be lined shall be smooth and free of rocks/stones, larger than 2 inches, sticks, roots, sharp objects, or debris. The surface shall provide a stable foundation for the membrane with no sudden, sharp, or abrupt changes at break in grade. No standing water or excessive moisture shall be allowed to accumulate on the subgrade. In addition to the surface deformities specifications described previously, no voids or depressions larger than 2 inches in any dimension shall be allowed. Such voids and depressions shall be filled with admix material to complete a level surface.

The CQA SUBCONTRACTOR and SUBCONTRACTOR/Geosynthetic Lining Subcontractor shall certify in writing that the surface on which the geomembrane will be installed is acceptable. The certificate of acceptance shall be given to the CONTRACTOR prior to commencement of geomembrane installation in the area under consideration.

Slope of the liner surface shall be in accordance with drawings.

After the soil liner surface has been accepted by the installer, it shall be the SUBCONTRACTOR's responsibility to indicate to the CONTRACTOR any change in the soil liner surface condition that may require repair work. If the CQA Subcontractor concurs, the SUBCONTRACTOR shall ensure that the soil liner surface is repaired.

Special care shall be taken to avoid desiccation cracking of the admix liner. The surface of the admix liner shall be maintained in the required condition throughout the course of geomembrane installation.

3.7 CONSTRUCTION QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

Records submitted to CONTRACTOR shall include, but not be limited to the following:

- (1) Measurement of weight and volume of materials used in admix, from scales, meters, and totalizers.
- (2) Calibration of scales, meters, totalizers, and other equipment used to prepare admix. Calibration shall be at manufacturers' recommended intervals or whenever rough handling, damage, or other factors indicate that accuracy may have been compromised. Methods used for calibration shall conform to manufacturers' recommendations. Secondary standards shall be traceable to national standards.
- (3) Control of individual lift thickness during placement and overall admix layer thickness. Subgrade and final admix surface elevations shall be determined by the CQA Subcontractor's surveyor on a minimum 50 foot grid and at grade breaks over the floor and side slopes of the disposal trench except that detailed surveying shall be required in the sump area and other locations to establish grade breaks and slope continuity as directed by the CONTRACTOR. Vertical survey accuracy shall be plus or minus 0.05 feet or better. Results shall be provided to the CONTRACTOR. No liner system materials shall be installed on the finished surface until satisfactory thickness of the admix layer has been verified.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory shall be furnished to the CONTRACTOR within one working day following the inspection or test.

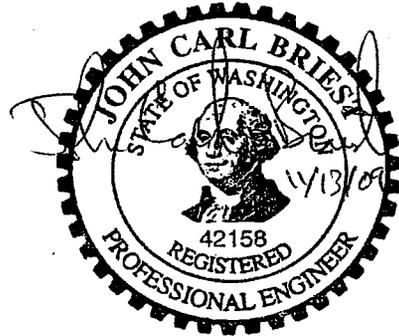
SPECIFICATION FOR

CELL CONSTRUCTION - GEOSYNTHETICS

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)

CELLS 9 & 10 CONSTRUCTION

WASHINGTON CLOSURE HANFORD		JOB NO. 14655
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP		
1. <input checked="" type="checkbox"/> Work may proceed. 2. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4. <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5. <input type="checkbox"/> Permission to proceed not required.		
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.		
	CIVIL GEOTECHNICAL GEOSYNTHETICAL ELECTRICAL MECHANICAL PROCESS MATERIAL CADD PROJECT MGT. ENVIRONMENTAL WASTE SAFETY INDUSTRIAL HYDRAULIC INSPECTION QA RECORD FIELD ENGINEER OTHER	
CHECK REVIEW REQUIREMENT	REVIEWED BY	DATE
<input type="checkbox"/>	<i>W.A. Balazs</i>	<i>11-23-2009</i>
Project Engineer/STW DOCUMENT ID NUMBER <i>506XS24A00CN03 05-011-004</i>		
SC/P.O. No.	SSRS ITEM	SUBMITTAL



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WCH - DOCUMENT CONTROL

Rev.	Date	Reason for Revision	Originator	Checker	Project Engineer	LEAD Design Eng.
0	11/13/09	Issued for Award	<i>W.A.</i>	<i>(NCN)</i>	<i>MB</i>	<i>JCB</i>
Washington Closure Hanford, LLC		RIVER CORRIDOR CLOSURE CONTRACT	Job No. 14655 Specification No. 0600X-SP-C0077 Page 1 of 45			

DOCUMENT CONTROL
mjp 11/24/09

CELL CONSTRUCTION - GEOSYNTHETICS

CONTENTS

1.0	GENERAL.....	5
1.1	SUMMARY.....	5
1.2	ABBREVIATIONS.....	5
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS.....	5
1.4	TECHNICAL SUBMITTALS.....	8
	1.4.1 Manufacturer's Data.....	8
	1.4.2 Installation Plan.....	8
	1.4.3 Quality Control Certification.....	8
1.5	DESCRIPTION.....	9
	1.5.1 Geomembrane.....	9
	1.5.2 Geotextiles.....	9
	1.5.3 Geocomposites.....	9
	1.5.4 Interface Friction Testing Requirements.....	9
2.0	MATERIALS AND EQUIPMENT.....	10
2.1	GEOMEMBRANE.....	10
	2.1.1 Types of Geomembrane.....	10
	2.1.2 Geomembrane Manufacturer.....	10
	2.1.3 Geomembrane Properties.....	11
	2.1.4 Geomembrane Manufacturing Quality Control.....	11
	2.1.5 Certification.....	12
	2.1.6 Manufacturing Plant Visit.....	12
	2.1.7 Conformance Testing.....	13
	2.1.8 Fabrication Quality Control.....	13
	2.1.9 Transportation, Handling, and Storage.....	13
2.2	GEOTEXTILES.....	14
	2.2.1 Types of Geotextiles.....	14
	2.2.2 Manufacturer.....	14
	2.2.3 Geotextile Properties.....	14
	2.2.4 Geotextile Conformance Testing.....	14
	2.2.5 Geotextile, Handling, and Storage.....	15
2.3	GEOCOMPOSITES.....	15
	2.3.1 Composition.....	15
	2.3.2 Manufacturer.....	15
	2.3.3 Geocomposite Properties.....	16
	2.3.4 Integrity.....	16
	2.3.5 Geocomposite Conformance Testing.....	16
	2.3.6 Geocomposite, Handling, and Storage.....	16
2.4	GEOSYNTHETIC PENETRATIONS.....	17
3.0	EXECUTION.....	17
3.1	GENERAL.....	17

3.1.1	Unacceptable Materials and Work.....	17
3.1.2	Personnel Qualifications	17
3.1.3	Applicability	17
3.1.4	Installation Plan	18
3.2	ANCHOR TRENCH EXCAVATION AND BACKFILLING	18
3.3	GEOMEMBRANE PLACEMENT - HDPE GEOMEMBRANE	18
3.3.1	Field Panel Identification.....	18
3.3.2	Field Panel Placement.....	18
3.3.3	Placement Conditions	19
3.3.4	Damage	19
3.4	FIELD SEAMING	20
3.4.1	Seaming Equipment and Products	20
3.4.2	Seam Layout	21
3.4.3	Weather Conditions for Seaming.....	22
3.4.4	Seam Preparation	23
3.4.5	General Seaming Procedures	23
3.5	GEOMEMBRANE SEAM TESTING	24
3.5.1	Trial Seams	24
3.5.2	Nondestructive Seam Continuity Testing	25
3.5.3	Destructive Seam Strength Testing.....	27
3.6	REPAIRS	29
3.6.1	General.....	29
3.6.2	Repair Procedures	29
3.6.3	Verification of Repairs.....	30
3.7	MATERIALS IN CONTACT WITH GEOMEMBRANE.....	30
3.7.1	Temperature	31
3.7.2	Minimum Thickness	31
3.7.3	Spreading Equipment.....	31
3.7.4	Spreading Operations.....	31
3.8	LINING SYSTEM ACCEPTANCE.....	31
3.9	GEOTEXTILES.....	32
3.9.1	Installation Plan	32
3.9.2	Geotextile Handling and Placement.....	32
3.9.3	Seaming.....	33
3.9.4	Geotextile Repair	33
3.9.5	Materials in Contact with Geotextiles.....	34
3.10	GEOCOMPOSITES	34
3.10.1	Installation Plan	34
3.10.2	Handling and Placement	34
3.10.3	Joining.....	35
3.10.4	Repair.....	36
3.10.5	Materials in Contact with Geocomposites	36
3.11	GEOSYNTHETIC PENETRATIONS	37
3.12	QUALITY ASSURANCE/QUALITY CONTROL	37

TABLES

TABLE 1 HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE – 60 MIL TEXTURED	38
TABLE 2 HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE - 100 MIL SMOOTH	40
TABLE 3. REQUIRED SEAM PROPERTIES.....	42
TABLE 4 REQUIRED GEOTEXTILE PROPERTIES	43
TABLE 5 REQUIRED GEONET PROPERTIES.....	44
TABLE 6 REQUIRED GEOCOMPOSITE PROPERTIES.....	45

CELL CONSTRUCTION - GEOSYNTHETICS

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for the Geosynthetics liner systems for the Environmental Restoration Disposal Facility (ERDF).

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
CQA	Construction Quality Assurance
CQC	Construction Quality Control
EPA	Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
HDPE	High Density Polyethylene
QAP	Quality Assurance Plan
SSRS	Subcontractor/Supplier Submittal Requirements Summary

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Cell Construction. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Cell Construction. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1004	Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
ASTM D1204	Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

ASTM D1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2,700 kNm/m ³))
ASTM D1603	Standard Test Method for Carbon Black Content in Olefin Plastics
ASTM D1777	Standard Test Method for Thickness of Textile Materials
ASTM D3786	Standard Test Method for Bursting Strength of Textile Fabrics - Diaphragm Bursting Strength Tester Method
ASTM D3895	Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D4218	Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
ASTM D4355	Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D4716	Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
ASTM D4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4833	Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
ASTM D5199	Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

ASTM D5261	Standard Test Method for Measuring Mass per Unit Area of Geotextiles
ASTM D5321	Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
ASTM D5397	Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D5641	Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
ASTM D5721	Standard Practice for Air-Oven Aging of Polyolefin Geomembranes
ASTM D5820	Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
ASTM D5885	Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Seaming Calorimetry
ASTM D5994	Standard Test Method for Measuring Core Thickness of Textured Geomembrane
ASTM D6392	Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Method
ASTM D6497	Standard Guide for Mechanical Attachment of Geomembrane to Penetrations or Structures
ASTM D6693	Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
ASTM D7005	Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
ASTM D7466	Standard Test Method for Measuring the asperity Height of Textured Geomembrane
EPA/600/R-93/182	EPA, Technical Guidance Document, Quality Assurance and Quality Control for Waste Containment Facilities*

GRIGM-11	UV Resistance (Accelerated Weathering of Geomembranes Using Fluorescent UVA Condensation Exposure Device)
GRIGM-12	Asperity Height (Asperity Measurement of Textured Geomembranes Using a Depth Gauge)
GRIGM-19	Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes
WAC 173 216	State Waste Discharge Permit Program
WAC 173 400	General Regulations for Air Pollution Sources

* Note that an update to EPA/600/R-93/182 has been published: Daniel, D.E. and Koerner, R. M. (2007). *Waste Containment Facilities: Guidance for Construction Quality Assurance and Construction Quality Control of Liner and Cover Systems*, second ed., ASCE, New York, NY, 351 pp.

1.4 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.4.1 Manufacturer's Data

Manufacturer's descriptive data, specification sheets, literature, and other data as necessary to fully demonstrate that those materials proposed for use comply with the requirements of these specifications. Certification that manufacturer has manufactured HDPE for at least 5 years and has manufactured a minimum of 10 million square feet.

1.4.2 Installation Plan

The SUBCONTRACTOR shall submit an installation plan describing the proposed methods for deployment, panel layout, seaming, including methods for connecting the new geosynthetics to the previously installed geosynthetics, repair, and protection. The plan shall include a quality control program for the SUBCONTRACTOR's activities related to geomembrane installation.

1.4.3 Quality Control Certification

Certifications for material composition and properties, Construction Quality Control (CQC) tests, admix surface, seam quality, equipment calibration, and other work activities as described in these specifications.

1.5 DESCRIPTION

Furnishing and installing the Geomembrane, Geotextile, and Geocomposite materials.

1.5.1 Geomembrane

The work includes manufacture, fabrication (if needed), supply, and installation of geomembrane as shown on the Drawings. Geomembrane is also referred to as High Density Polyethylene (HDPE) liner or flexible membrane liner (FML).

1.5.2 Geotextiles

The work includes manufacture, fabrication (if needed), supply, and installation of geotextiles as shown on the Drawings. This section also applies to geotextiles used to fabricate geocomposite drainage layers.

1.5.3 Geocomposites

The work includes manufacture, fabrication (if needed), supply, and installation of geocomposite drainage layers. The geocomposite will consist of a layer of geotextile 100% thermally bonded to each side of a geonet.

1.5.4 Interface Friction Testing Requirements

The materials used for construction shall meet the interface strength requirements of the design. To document that this requirement has been met, the SUBCONTRACTOR shall conduct the following test program prior to ordering materials.

Two sets of Interface Friction Testing in accordance with ASTM D5321 shall be conducted on the following interfaces:

- a. 60 mil textured geomembrane and the soil/bentonite admix
- b. 60 mil textured geomembrane and geocomposite
- c. Geocomposite and operations layer material

Testing shall be conducted under saturated conditions at nominal normal loads of 200, 400, and 600 psf to determine the peak angle and residual angle measured at a displacement of 2 inches. If the geomembrane texturing is variable, additional of tests will be required for interfaces with the geomembrane.

The residual friction angle of the interface friction testing shall meet the following minimum values with a normal load of 400 psf at a displacement of 2 inches and a cohesion of 0.

- | | | |
|----|---|-------|
| a. | 60 mil geomembrane/soil-bentonite admix | 24.0° |
| b. | 60 mil geomembrane/geocomposite | 24.0° |
| c. | geocomposite/operations layer material | 24.0° |

The average asperity height of the textured geomembrane utilized in the interface friction testing program will set the standard for all textured materials manufactured and delivered for installation. Materials not meeting this requirement will be rejected from use unless another friction angle test program is conducted with adjacent materials to document conformance with the design requirements.

SUBCONTRACTOR shall submit the results of the interface friction testing prior to shipment of the material. The CONTRACTOR will review this data for conformance with project strength requirements. At the direction of the CONTRACTOR, a registered professional engineer licensed in the State of Washington will prepare a stability analysis using the submitted data. The analysis will evaluate the proposed material's strength to determine if the required factors of safety of 1.0 and 1.3 under seismic and static are met. Allow CONTRACTOR 30 calendar days after receipt of the testing results for this evaluation.

Other combinations of shear strength parameters which can be shown by standard analytical techniques to provide static and dynamic factors of safety against slope failure that are equivalent or greater than those specified may be acceptable if approved by the CONTRACTOR.

2.0 MATERIALS AND EQUIPMENT

2.1 GEOMEMBRANE

2.1.1 Types of Geomembrane

- a. Geomembrane for the primary and secondary liner systems shall be un-reinforced HDPE, 60 mil thick, textured both sides, with smooth (non-textured) surfaces on both sides along the longitudinal edges of each panel.
- b. Geomembrane for miscellaneous applications including the crest pad, rub sheets in sumps, and other applications as shown on the Drawings shall be un-reinforced HDPE, 100 mil thick, smooth.
- c. Geomembrane shall be produced with a white surface.

2.1.2 Geomembrane Manufacturer

The HDPE Geomembrane Manufacturer shall have a minimum of five years of experience as a commercial manufacturer of HDPE geomembranes for landfill applications. Manufacturer shall

have manufactured HDPE for at least 5 years and manufactured a minimum of 10 million square feet.

2.1.3 Geomembrane Properties

2.1.3.1 Use of Recycled Polymer. The raw material shall be new polyethylene resin containing no more than 2% clean recycled polymer by weight. Two percent recycled polymer shall not include any finished sheet material that has actually seen some type of service performance. Re grind, reworked or trim materials in the form of chips or edge strips that have not actually seen some type of use may be added, if the material is from the same manufacturer and is the same formulation as the geomembrane being produced.

2.1.3.2 Resin Properties. The raw resin, (without carbon black) shall meet the following specifications:

- a. Specific Gravity (ASTM D1505/D792): > 0.930.

2.1.3.3 Finished Sheet Properties. The physical, mechanical, and environmental properties of the finished sheet shall meet or exceed the values specified in the tables for Required Geomembrane Properties at the end of this Technical Specification section. Where applicable, values in the table are Minimum Average Values.

2.1.4 Geomembrane Manufacturing Quality Control

2.1.4.1 Quality Control Testing. Quality control testing shall be carried out by the Manufacturer to demonstrate that the geomembrane meets the specifications specified above and in Geomembrane Tables. The CQA Subcontractor may carry out additional testing for purposes of determining conformance. If the results of the Manufacturer's and the CQA Subcontractor's testing differ significantly (i.e. greater than 10%), the testing shall be repeated by the CQA Subcontractor, and the Manufacturer shall be allowed to monitor this testing. The results of this latter series of tests will prevail, provided that the applicable test methods have been followed.

2.1.4.2 Required Information. Prior to the delivery of any geomembrane material, the Manufacturer shall submit the following information:

- a. The origin (Resin Supplier's name, resin production plant), identification (brand name, number) and production date of the resin.
- b. A list of quantities and descriptions of materials other than the base polymer which comprise the geomembrane.
- c. Copies of the quality control certificates issued by the Resin Supplier.
- d. Reports on the tests conducted by the Manufacturer to confirm that the quality of the resin used to manufacture the geomembrane satisfy these Specifications.

- e. A statement that recycled polymer (if any) is clean and does not exceed 2% by weight.
- f. A properties sheet including, at a minimum, specified properties, measured using test methods indicated in these specifications, or equivalent.
- g. Test reports, including sampling procedures, conducted by the Manufacturer to confirm that the geomembrane meets the specifications. Tests shall be conducted on each production lot of geomembrane or every 53,820 square feet, whichever results in the greater number of tests.
- h. A certification that property values given in the properties sheet are guaranteed by the Geomembrane Manufacturer.

2.1.5 Certification

Prior to shipment, the Geomembrane Manufacturer shall provide a quality control certificate for each roll of geomembrane. The quality control certificate shall be signed by a responsible party employed by the Geomembrane Manufacturer, such as the production manager. The quality control certificate shall include:

- a. Roll numbers and identification, resin lot, and batch numbers.
- b. Sampling procedures and results of quality control tests.
- c. Information package containing the information required by Section 2.2.5.

2.1.6 Manufacturing Plant Visit

The Manufacturer shall allow the CONTRACTOR or his designated representative to visit the manufacturing plant, if the CONTRACTOR so chooses. If possible, the visit shall be prior to or during the manufacturing of the geomembrane rolls for the specific project. The CONTRACTOR or his designated representative shall review the manufacturing process, quality control, laboratory facilities, and testing procedures.

During the visit, visiting personnel will also:

- a. Confirm that the measurements of properties by the Manufacturer are properly documented and test methods used are acceptable.
- b. Spot inspect the rolls and confirm that they are free of holes, blisters, or any sign of contamination by foreign matter.

- c. Review packaging and transportation procedures to confirm that these procedures are not damaging the geomembrane.
- d. Confirm that roll packages have a label indicating the name of the manufacturer, type of geomembrane, thickness, and roll number.
- e. If applicable, confirm that extrusion rods and/or beads are derived from the same base resin as the geomembrane.

The Geomembrane Manufacturer shall accommodate these activities.

2.1.7 Conformance Testing

Prior to shipment, the CQA Subcontractor shall obtain samples and perform testing in accordance with the Construction Quality Assurance Plan. The CQA Subcontractor will test the samples to determine conformance to both the design specifications and the list of guaranteed properties.

2.1.8 Fabrication Quality Control

Factory panel fabrication, if any, shall be in accordance with the applicable sections of these Technical Specifications for field panel placement and seaming.

2.1.9 Transportation, Handling, and Storage

Transportation of the geomembrane shall be the responsibility of the SUBCONTRACTOR. Handling on site shall be the responsibility of the SUBCONTRACTOR.

Upon delivery at the site, the SUBCONTRACTOR and the CQA Subcontractor shall observe the surfaces of rolls or factory panels for defects and for damage. This inspection shall be conducted without unrolling rolls or unfolding factory panels unless defects or damages are found or suspected. The CQA Subcontractor will determine:

- a. Rolls, factory panels, or portions thereof, which shall be rejected and removed from the site because they do not meet requirements.
- b. Rolls or factory panels which include repairable flaws.
- c. Rolls or factory panels that are not properly labeled. No unlabelled rolls shall be used for any application. Unlabelled rolls shall be removed from the site and replaced at the SUBCONTRACTOR's expense.

The SUBCONTRACTOR shall be responsible for storage and protection of the geomembrane. Geomembrane rolls shall be stored on a prepared subgrade free of rocks and graded to drain away from stored materials.

2.2 GEOTEXTILES

2.2.1 Types of Geotextiles

- a. Type A geotextile shall be 8 oz/yd² nominal weight and shall be used for separation of operations and drainage layers in the landfill, in the geocomposite drainage layer, and at other locations as shown on the Drawings.
- b. Type B geotextile shall be 16 oz/yd² nominal weight and shall be used for cushioning of geomembranes on the landfill floor and at other locations as shown on the Drawings.

Geotextiles, regardless of type, shall be nonwoven, needle punched polypropylene.

2.2.2 Manufacturer

The Geotextile Manufacturer shall have a minimum of five years of experience as a commercial manufacturer of geotextiles for landfill applications.

2.2.3 Geotextile Properties

2.2.3.1 Property Values. Geotextile properties shall meet or exceed the values specified in the table titled "Required Geotextile Properties".

The Manufacturer shall provide test results for properties listed in the Referenced Table

The Manufacturer shall certify that the materials supplied meet the requirements of this Subcontract.

2.2.3.2 Integrity. Geotextiles shall retain their structure during handling, placement, and long-term service.

2.2.4 Geotextile Conformance Testing

Prior to shipment, the CQA Subcontractor shall obtain samples and perform testing in accordance with the Construction Quality Assurance Plan. The CQA Subcontractor will test the samples to determine conformance to both the design specifications and the list of guaranteed properties.

2.2.5 Geotextile, Handling, and Storage

Geotextiles shall be supplied in rolls wrapped in protective dust-proof covers and marked or tagged with the following information:

- a. Manufacturer's name.
- b. Product identification.
- c. Lot number.
- d. Roll number.
- e. Roll dimensions.

Transportation of the geotextiles to the site and handling on site shall be the responsibility of the SUBCONTRACTOR.

During shipment and storage, the geotextile shall be protected from mud, dirt, dust, puncture, cutting, moisture, or other damaging or deleterious conditions. Geotextile shall be stored on a prepared subgrade free of rocks graded to drain away from stored materials.

The SUBCONTRACTOR shall be responsible for the storage and protection of the geotextiles. Geotextile stockpile shall be covered with a tarp to protect from all sunlight, dust, and precipitation.

2.3 GEOCOMPOSITES

The work includes manufacture, fabrication (if needed), supply, and installation of geocomposite drainage layers. The geocomposite will consist of a layer of geotextile thermally bonded to each side of a geonet. Requirements for geotextiles are contained in Section 2.2 GEOTEXTILES, of these Specifications. Requirements for geonets and the finished geocomposite are contained in this section.

2.3.1 Composition

The geonet shall be high density polyethylene (HDPE).

The geocomposite shall consist of Type A geotextile 100% thermally bonded to each side of the HDPE geonet.

2.3.2 Manufacturer

The Geocomposite Manufacturer shall have a minimum of five years experience as a commercial manufacturer of geocomposites for landfill drainage applications.

2.3.3 Geocomposite Properties

2.3.3.1 Geonet. Geonet properties shall meet or exceed the values specified in the table titled "Required Geonet Properties".

2.3.3.2 Geotextile. Geotextile properties shall meet or exceed the values specified in the referenced table.

2.3.3.3 Manufacturer's Certification. The Manufacturer shall provide specification sheets, literature and test results for properties listed in these Specifications.

The Manufacturer shall certify that the materials supplied meet the requirements of this Technical Specification.

2.3.4 Integrity

Geonets and Geocomposites shall retain their structure during handling, placement, and long-term service. Unbonded areas of geotextile to geonet shall be subject to rejection.

2.3.5 Geocomposite Conformance Testing

Prior to shipment, the CQA Subcontractor shall obtain samples and perform testing in accordance with the Construction Quality Assurance Plan. The CQA Subcontractor will test the samples to determine conformance to both the design specifications and the list of guaranteed properties.

2.3.6 Geocomposite, Handling, and Storage

Geocomposite shall be fabricated prior to transporting and shall be supplied in rolls wrapped in protective dust-proof covers and marked or tagged with of the following information:

- a. Manufacture's name.
- b. Product identification.
- c. Lot number.
- d. Roll number.
- e. Roll dimensions.

Transportation and handling of the geocomposite will be the responsibility of the SUBCONTRACTOR. Geocomposites shall be stored on a prepared subgrade, free of rocks, and graded to drain away from stored materials.

During shipment and storage, the geocomposite shall be protected from mud, dirt, dust, puncture, cutting, moisture, or other damaging or deleterious conditions.

The SUBCONTRACTOR shall be responsible for the storage and protection of the geocomposite materials. Geocomposite stockpile shall be covered with a tarp to protect from all sunlight, dust and precipitation.

2.4 GEOSYNTHETIC PENETRATIONS

Materials for Geosynthetic penetrations shall be in conformance to ASTM D6497.

3.0 EXECUTION

3.1 GENERAL

3.1.1 Unacceptable Materials and Work

Materials and work that fail to meet the requirements of the Subcontract shall be removed and disposed of at the SUBCONTRACTOR's expense.

3.1.2 Personnel Qualifications

3.1.2.1 Installer Organization. At a minimum, the Geosynthetics Installer shall have successfully completed at least 10 projects consisting of installation of at least 10,000,000 ft² (total) of HDPE liner. Projects shall include Resource Conservation and Recovery Act (RCRA) landfills and surface impoundments.

3.1.2.2 Seaming Personnel. Personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests similar to those described in this Technical Specification. The superintendent and lead welder foreman shall have experience seaming a minimum of 2,000,000 ft² of polyethylene geomembrane using the same type of seaming apparatus proposed for use on this project. These individuals shall provide direct supervision over less experienced seamers. No field seaming shall take place without one of these individuals being present in the cell area.

3.1.3 Applicability

Geosynthetic materials shall be installed at the locations, lines and grades shown on the Drawings. Liners shall be installed in accordance with the Subcontract.

3.1.4 Installation Plan

The SUBCONTRACTOR shall submit a plan describing the proposed methods for unloading, storage, deployment, panel layout, seaming, testing, repair, and protection. This shall include the type and weight of any equipment proposed for deployment and detailed methodology for installation over existing admix and geosynthetics to prevent damage.

3.2 ANCHOR TRENCH EXCAVATION AND BACKFILLING

The anchor trench shall be excavated to the lines and widths shown on the Drawings, prior to geosynthetics installation. All areas in contact with the geomembrane shall be rounded with a minimum 6 inch radius so as to avoid sharp bends in the geosynthetic. No loose soil shall be allowed to underlie the geomembrane in the anchor trench. All CQA and CQC activities shall continue through the anchor trench.

Geosynthetics shall be anchored as shown on the Drawings. The backfill material and placement method shall be as described in Specification 0600X-SP-C0075.

3.3 GEOMEMBRANE PLACEMENT - HDPE GEOMEMBRANE

3.3.1 Field Panel Identification

A field panel is the unit area of geomembrane that is to be seamed in the field.

- a. A field panel is a roll or a portion of roll cut in the field that is in intimate contact with the underlying material (as opposed to a patch).

The CQA Subcontractor and SUBCONTRACTOR shall agree on a numbering system and assign each field panel an "identification code" consistent with the layout plan. This field panel identification code shall be as simple and logical as possible. (Note that roll numbers assigned in the manufacturing plant are usually cumbersome and are not related to location in the field.)

The CQA Subcontractor will establish a table or chart showing correspondence between roll numbers, factory panels, and field panel identification codes. The field panel identification code shall be used for CQC and CQA.

3.3.2 Field Panel Placement

3.3.2.1 Location. Field panels shall be installed at the locations indicated in the SUBCONTRACTOR layout plan, approved by the CONTRACTOR with white side up.

3.3.2.2 Installation Schedule. Panels deployed shall be continuously welded the same day deployed.

3.3.2.3 Geomembrane Handling and Placement

- a. The SUBCONTRACTOR shall handle geomembranes in such a manner as to ensure it is not damaged. Dragging or pulling of geomembrane over subgrade will not be allowed, such that the "texture" gets rubbed off. A rub sheet may be used upon the approval of the CONTRACTOR.
- b. In the presence of wind, exposed geomembrane shall be weighted with ultraviolet resistant sandbags or as approved. Sandbags shall be installed during placement and shall remain until replaced with cover material. CONTRACTOR's equipment shall not be used to weight down geomembranes.
- c. Geomembranes shall be cut using an approved geomembrane cutter only. Underlying geosynthetic materials shall not be damaged during cutting.
- d. After installation, the geomembrane shall be examined over its entire surface to ensure that no potentially harmful foreign objects, such as needles, rocks, debris, etc are present. Any foreign objects encountered shall be removed.
- e. Vehicles will not be permitted on geomembrane unless approved by CONTRACTOR.
- f. Precautions shall be taken against "snow blindness" of personnel working on the white geomembrane.

3.3.3 Placement Conditions

Geomembrane placement shall not proceed at an ambient temperature below 32 degrees F or above 104 degrees F as measured 12 inches above the geomembrane surface, unless otherwise authorized by the CONTRACTOR. Geomembrane placement shall not be done during any precipitation, in the presence of excessive moisture (e.g., snow, ice, fog, dew), in an area of ponded water, or in the presence of winds over 20 mph. Placement methods shall prevent damage to underlying admix or geosynthetic materials. Driving directly on any geosynthetic layer is not allowed, unless approved in advance by the CONTRACTOR as part of the installation plan.

3.3.4 Damage

The SUBCONTRACTOR and the CQA Subcontractor shall inspect each panel, after placement and prior to seaming, for damage. The CQA Subcontractor will advise the SUBCONTRACTOR which panels, or portions of panels, shall be rejected, repaired, or accepted. Damaged panels or portions of damaged panels that have been rejected shall be removed from the work area. Repairs shall be made according to procedures approved by the CONTRACTOR.

3.4 FIELD SEAMING

3.4.1 Seaming Equipment and Products

Approved seaming methods are extrusion welding and single or dual track fusion welding. Fusion welding shall be utilized for tie-in seams between existing and new geomembrane. Seaming shall be a continuous process with a minimum of interruptions along any given seam. The Installer shall maintain at least two operable spare seaming units on site. Extrusion welding shall be limited to repairs and tie-ins. Proposed alternate processes shall be documented and submitted to the CONTRACTOR for approval. Only equipment that has been specifically approved by make and model shall be used.

3.4.1.1 Extrusion Process. The extrusion-welding machine shall be equipped with gages capable of measuring the temperature at the nozzle or the preheat temperature.

The SUBCONTRACTOR shall provide documentation regarding the extrudate to the CQA Subcontractor and shall certify that the extrudate is compatible with these Specifications and is comprised of the same resin type as the geomembrane sheeting.

The SUBCONTRACTOR shall comply with the following:

- a. Maintain a sufficient number of spare operable seaming machines (at least two spare extrusion seaming machines) on site to ensure continuous operation. Spare parts and consumables also shall be maintained on site.
- b. The equipment used for seaming shall not damage the geomembrane.
- c. The extruder shall be purged prior to beginning a seam until heat-degraded extrudate has been removed from the barrel.
- d. Seaming machine and support equipment (electric generators, miscellaneous tools, etc.) shall be placed on a geomembrane rub sheet base such that no damage occurs to the geomembrane.
- e. Grinding shall be completed no more than 1 hour prior to seaming.
- f. A smooth insulating plate or fabric shall be placed beneath the hot welding machine after usage.
- g. The geomembrane shall be protected from damage.

3.4.1.2 Fusion Process. The fusion-welding machines shall be automated self-propelled devices. The fusion-welding machines shall be equipped with gauges giving the applicable temperatures.

The SUBCONTRACTOR shall comply with the following:

- a. Maintain a sufficient number of spare operable seaming machines (at least two spare fusion seaming machines) on site to ensure continuous operations. Spare parts and consumables also shall be maintained on site.
- b. The equipment used for seaming shall not damage the geomembrane.
- c. The seaming machine and support equipment (electric generators, compressors, vacuum pumps, miscellaneous tools, etc.) shall be placed on a geomembrane rub sheet base such that no damage occurs to the geomembrane.
- d. A smooth insulating plate of fabric shall be placed beneath the hot welding machine after usage.
- e. The geomembrane shall be protected from damage.
- f. A movable protective layer may be used directly below each overlap of geomembrane to be seamed to prevent buildup of moisture between the sheets. At no time can this protective layer be left in place.

3.4.2 Seam Layout

The SUBCONTRACTOR shall provide the CONTRACTOR and the CQA Subcontractor with a seam layout drawing, i.e., a drawing of the facility to be lined showing expected seams. The CQA Subcontractor will review the seam layout drawing and confirm that it is consistent with accepted state of practice. No panels shall be seamed in the field without the CONTRACTOR's approval. No panels not specifically shown on the seam layout drawing shall be used without the CONTRACTOR's prior approval.

In general, seams shall be oriented parallel to the line of maximum slope, i.e., oriented along, not across, the slope and over laps shall be shingled down the slope. In corners and odd-shaped geometric locations, the number of seams shall be minimized. On the landfill floor, no horizontal seam shall be less than 5 feet from the toe of the slope, or other area of potential stress concentrations, unless otherwise authorized by the CONTRACTOR. The geomembrane shall not have horizontal seams on the side slopes.

On slopes or grades steeper than ten percent, seams shall be oriented down and not across the slope. No horizontal seam shall be less than 5 feet from the top of the slope or other area of potential stress concentration. Seams shall not line up with leachate piping runs. The number of field seams shall be minimized in areas such as corners and odd-shaped geometric locations. In anchor trenches, the geomembrane shall be continuous through the trench, over the crest, and down the slope.

Seams shall be aligned to produce the fewest possible number of wrinkles and "fishmouths".

A seam numbering system consistent with the panel numbering system shall be established by the CQA Subcontractor and SUBCONTRACTOR prior to liner installation. This system shall be submitted to the CONTRACTOR.

3.4.3 Weather Conditions for Seaming

The allowable weather conditions for seaming are as follows:

- a. Unless authorized in writing by the CONTRACTOR, no seaming shall be attempted at ambient temperatures below 32 degrees F or above 104 degrees F as measured 12 inches above the liner. The CQA Subcontractor will confirm that these weather conditions are fulfilled and will advise the SUBCONTRACTOR if they are not. The CONTRACTOR will then decide if the installation will be postponed or if modified procedures shall be used.
- b. The geomembrane shall be dry, protected from wind, and free of dust.

If the Installer wishes to use methods that will allow seaming at ambient temperatures below 32 degrees F, the SUBCONTRACTOR shall certify in writing that the quality of the seams welded at these temperatures is the same as the quality of seams welded at temperatures above 32 degrees F as measured 12 inches above the geomembrane surface, unless otherwise authorized by the CONTRACTOR. In addition, if the SUBCONTRACTOR wishes to seam at ambient temperatures below 32 degrees F the following conditions shall be satisfied in addition to the general seaming procedures:

- a. For extrusion welding, preheating shall be performed. Preheating may be waived, if it is demonstrated to the satisfaction of the CQA Subcontractor that welds of equivalent quality may be obtained without preheating.
- b. Preheating equipment shall be approved by the CONTRACTOR prior to use.
- c. Sheet grinding, if required, may be performed before preheating.
- d. The CQA Subcontractor will observe areas of the geomembrane that have been preheated to determine if subjected to excessive melting.
- e. The SUBCONTRACTOR and CQA Subcontractor shall confirm that geomembrane surface temperatures have not decreased below the minimum specified for welding, due to wind or other adverse conditions. Wind protection for the seam area may be required by the SUBCONTRACTOR.
- f. Trial seams shall be made in the immediate area where seaming will occur, under the same subgrade and same ambient temperature and preheating conditions as the actual seams. New trial seams shall be made if the ambient temperature

decreases by more than 5 degrees F from the previous trial seam conditions. Such new trial seams shall be conducted at the end of the seam in progress during the temperature drop.

- g. Additional destructive seam tests may be performed by the SUBCONTRACTOR at the CQA Subcontractor's discretion.
- h. The SUBCONTRACTOR shall test sample coupons cut from each end of the seam. The CQA Subcontractor will observe the installer testing these coupons in the field.
- i. Testing required by these Specifications or the CQA Plan shall also be performed on seams fabricated at temperatures below 32 degrees F.

3.4.4 Seam Preparation

3.4.4.1 Cleaning. Prior to seaming, the seam area shall be clean and free of moisture, dust, dirt, debris of any kind, and foreign material. Special attention shall be paid to cleaning the existing geomembrane at tie-in locations. Cleaning shall not damage the liner.

3.4.4.2 Overlap. Cross slope seams on both the trench floor and sidewalls shall be overlapped so that liquids are not trapped, i.e., seams shall be shingled down slope.

If seam overlap grinding is required, the process shall be completed according to the Geomembrane Manufacturer's instructions within one hour of the seaming operation and not damage the geomembrane. SUBCONTRACTOR shall submit procedures to perform seam grinding.

Panels of geomembrane shall have a finished overlap as recommended by the manufacturer. However, in any event sufficient overlap shall be provided to allow peel and shear tests to be performed on the seam.

Prior to seaming, geomembrane rolls or panels shall be overlapped a minimum of 3 inches for extrusion welding and 5 inches for fusion welding or as recommended by manufacturer.

3.4.4.3 Use of solvents. No solvent or adhesive shall be used.

3.4.4.4 Temporary Bonding. The procedure used to temporarily bond adjacent panels together shall not damage the geomembrane; in particular, the temperature of hot air at the nozzle of any spot welding apparatus shall be controlled such that the geomembrane is not damaged.

3.4.5 General Seaming Procedures

The general seaming procedure used by the SUBCONTRACTOR shall be as follows:

- a. Seaming shall extend to the outside edge of panels to be placed in the anchor trench.
- b. A firm substrate shall be provided by using a flat board, a conveyor belt, or similar hard surface directly under the seam overlap to achieve proper support.
- c. If seaming operations are carried out at night, 5 foot-candles of lighting is required by OSHA and shall be provided by SUBCONTRACTOR for workers as well as the CONTRACTOR and CQA Subcontractor.
- d. "Fishmouths" or wrinkles at the seam overlaps shall be cut along the ridge of the wrinkle in order to achieve a flat overlap. The cut "fishmouths" or wrinkles shall be seamed, and any portion where the overlap is inadequate shall then be patched with an oval or round patch of the same geomembrane extending a minimum of 6 inches beyond the cut in each direction.
- e. When seaming of the geomembrane liner has been completed and prior to placing overlying materials, the CQA Subcontractor will observe the geomembrane for wrinkles. The SUBCONTRACTOR and CQA Subcontractor will indicate which wrinkles shall be cut and seamed or otherwise repaired by the SUBCONTRACTOR. The resulting seam(s) shall be tested like any other seam.
- f. Geomembrane in sump areas shall be installed and tested. Extreme care shall be taken while welding around appurtenances since neither nondestructive nor destructive testing may be feasible in these areas. The Installer shall ensure that the geomembrane is not visibly damaged during installation.

3.5 GEOMEMBRANE SEAM TESTING

Training and qualification procedures and records shall be submitted to the CONTRACTOR.

SUBCONTRACTOR shall submit vacuum, air, and non destructive testing procedures for CONTRACTOR approval.

Testing records shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

3.5.1 Trial Seams

Trial seams shall be made on fragment pieces of geomembrane liner to verify that seaming conditions are adequate. Trial seams shall be made at the beginning of each seaming period, and at least once each four hours, for each seaming machine and operator used that day and shall be made in the presence of the CQA Subcontractor. This frequency may be increased at the direction of the CQA Subcontractor. Trial seams shall be made under the same conditions and on the same subgrade as actual seams.

Trial welds shall be conducted for different material types. (i.e. smooth to smooth, smooth to textured and textured to textured)

The trial seam sample shall be at least 2 feet long by 1 foot wide (after seaming) with the seam centered lengthwise. Seam overlap shall be as indicated in this Technical Specification.

Six adjoining specimens, each 1 inch wide, shall be cut from the trial seam sample by the SUBCONTRACTOR. The specimens shall be alternately tested in shear and peel using a calibrated field tensiometer, and they shall not fail in the seam. If a specimen fails, the entire trial seaming operation for the failed configuration shall be repeated. If the additional specimen fails, the seaming apparatus and seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful full trial seams are achieved. Records of trial seam testing shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

Test equipment shall be in calibration and conform to manufacturer's specifications. The SUBCONTRACTOR shall provide the CONTRACTOR with current calibration certificates.

3.5.2 Nondestructive Seam Continuity Testing

3.5.2.1 General. The SUBCONTRACTOR shall nondestructively test field seams over their full length using a vacuum test unit, air pressure test (for double fusion seams only), or other approved method. Vacuum testing and air pressure testing are described below. The purpose of the nondestructive test is to check the continuity of seams. It does not provide any information on seam strength. Continuity testing shall be done as the seaming work progresses.

Any seams that fail nondestructive testing shall be repaired in accordance with these Specifications. Seams that cannot be nondestructively tested because of seam geometry shall be double welded or capped. Records of repair seam testing shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

Test equipment shall be in calibration and conform to manufacturer's specifications. The SUBCONTRACTOR shall submit current calibration certificates.

3.5.2.2 Vacuum Testing (ASTM D5641). The equipment shall be comprised of the following:

- a. A vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, port hole or valve assembly, and a vacuum gage.
- b. A steel vacuum tank and pump assembly equipped with a pressure controller and connections.
- c. A rubber pressure/vacuum hose with fittings and connections.

- d. A bucket and wide paint brush.
- e. A soapy solution.

The following procedures shall be used:

- a. Energize the vacuum pump and reduce the tank pressure to a minimum of 5 inches of mercury.
- b. Wet a strip of geomembrane approximately 12 inches wide by 48 inches long with the soapy solution. The soapy solution shall not dry before the area is vacuum tested.
- c. Place the vacuum box over the test area.
- d. Close the bleed valve and open the vacuum valve.
- e. Ensure that a leak tight seal is created.
- f. For a period of not less than 10 seconds, examine the geomembrane through the viewing window for the presence of soap bubbles.
- g. If no bubble appears after 10 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inch overlap, and repeat the process.
- h. Areas where soap bubbles appear shall be marked and repaired in accordance with the Technical Specifications.

3.5.2.3 Air Pressure Testing (ASTM D5820). The following procedures are applicable only to those processes that produce a double seam with an enclosed air channel. All double seams with an enclosed air channel shall be air pressure tested. The equipment shall be comprised of the following:

- a. An air pump (manual or motor driven) capable of generating and sustaining a pressure of at least 40 psi.
- b. A rubber hose with fittings and connections.
- c. A sharp hollow needle, or other approved pressure feed device.
- d. A calibrated pressure gage in 1 psi increments capable of reading pressures up to 40 psi.

The following procedures shall be used:

- a. Seal both ends of the seam to be tested.
- b. Insert needle with pressure gauge, or other approved pressure feed device, into the air channel created by the fusion weld.
- c. If the seam is 1/2-inch wide, energize the air pump and pressurize the channel to a minimum of 30 psi. Close the valve and sustain the pressure for a minimum of 5 minutes.
- d. If a pressure loss greater than 2 psi is observed at either end or if the required pressure cannot be reached, then the seam shall be rejected. If the seam does not stabilize, locate faulty area and repair in accordance with this section. If, in the judgment of the CQA Subcontractor, significant changes in geomembrane temperature occur during the test (e.g., due to cloud cover), the test shall be repeated after the geomembrane temperature has stabilized.
- e. Cut end of seam opposite to the pressure gage and observe that the pressure drops. If the pressure does not drop, locate the obstruction(s) in the seam, repair, and retest seam.
- f. Remove needle or other approved pressure feed device and repair seam.
- g. Faulty areas along the seam shall be identified, repaired in accordance with approved procedures, and retested. Holes created during nondestructive testing shall be repaired in accordance with approved procedures as described in the Specifications upon completion of the test.
- h. Gauges shall be calibrated annually, at the project beginning, and at the discretion of the CONTRACTOR.

3.5.3 Destructive Seam Strength Testing

3.5.3.1 General. Destructive seam tests shall be performed at selected locations. The purpose of these tests is to evaluate seam strength. Seam strength testing shall be done as the seaming work progresses. The samples shall meet the requirements of the table titled "Required Seam Properties".

Test equipment shall be in calibration and conform to manufacture's specifications. The SUBCONTRACTOR shall submit current calibration certificates.

3.5.3.2 Location and Frequency. The CQA Subcontractor will select locations where seam samples shall be removed for laboratory testing by the SUBCONTRACTOR.

Sampling frequency shall be a minimum of one sample per 492 feet of seam length per welding machine per day (this minimum frequency shall be determined as an average taken from the panels, including welds for caps), or a minimum of two samples per factory panel, whichever gives the largest number of samples. This frequency may be increased at the discretion of the CQA Subcontractor or CONTRACTOR.

3.5.3.3 Sampling Procedures. Samples shall be cut by the SUBCONTRACTOR as the seaming progresses to provide laboratory test results before completion of installation. The SUBCONTRACTOR shall assign a number to each sample, mark it accordingly, and record the sample location on the layout drawing.

Holes in the geomembrane resulting from destructive seam sampling shall be immediately repaired in accordance with repair procedures. The continuity of the new seams in the repaired area shall be tested as described in this Technical Specification.

3.5.3.4 Sample Size. The samples shall be 12 inches wide by 42 inches long with the seam centered lengthwise. One 1 inch wide strip shall be cut from each end of the samples, and these shall be tested in the field as described below. The remaining sample shall be cut into three parts and distributed as follows:

- a. One portion to the SUBCONTRACTOR for testing at his discretion, 12 inches x 12 inches.
- b. One portion to the CONTRACTOR for archive storage, 12 inches x 12 inches.
- c. One portion to the CQA Subcontractor for testing, 12 inches x 16 inches.

3.5.3.5 Field Testing. The two 1 inch wide strips described above shall be tested in the field by tensiometer for peel and shear and shall not fail in the seam. If any test sample fails to pass, then the procedures outlined below (Procedures for Destructive Test Failure) shall be followed.

The CQA Subcontractor will mark samples and portions with their number. The CQA Subcontractor will also record the date and time, ambient temperature, number of seaming unit, name of seamer, welding apparatus temperatures and pressures, and pass or fail descriptions, and attach a copy to each sample portion.

3.5.3.6 Procedures for Areas Failing Destructive Tests. The following procedures shall apply whenever a sample fails a destructive test, whether that test is conducted by the CQA Laboratory, the SUBCONTRACTOR's laboratory, or by field tensiometer. The SUBCONTRACTOR has two options:

- a. Cap the seam or replace the seam between any two passing test locations, or
- b. Trace the seam to two intermediate locations 10 feet minimum from the point of the failed test in each direction and take a small sample for an additional field test

at each location. If these additional samples pass the test, then full samples shall be taken for CQA laboratory testing. If these laboratory samples pass the tests, then the seam shall be capped or replaced between these locations. If either sample fails, then the sampling and testing process shall be repeated to establish the zone over which the seam shall be capped.

When possible all acceptable capped or replaced seams shall be bounded by two locations from which samples passing CQA laboratory destructive tests have been taken. If all welding for a machine has been capped or replaced, it is not always possible to get a passing sample. The CQA Subcontractor will decide whether or not taking a sample from the capping seam for destructive testing is warranted.

3.6 REPAIRS

3.6.1 General

Any portion of the geomembrane exhibiting a flaw or failing a destructive or nondestructive test shall be repaired. Repairs shall be conducted in accordance with this technical specification and shall be subjected to the nondestructive seam testing procedures. All damage that fully penetrates the layers shall be repaired with a patch.

Each patch or other type of repair shall be numbered and recorded and documentation shall be reviewed and approved by the CQA Subcontractor.

SUBCONTRACTOR training and qualification procedures and records shall be submitted to the CONTRACTOR.

SUBCONTRACTOR shall submit repair procedures for CONTRACTOR approval.

Repair records shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

Repairs are to be performed at the SUBCONTRACTOR's expense.

3.6.2 Repair Procedures

Several procedures exist for repair. The decision as to the appropriate repair procedure, materials, and equipment shall be agreed upon in advance between the SUBCONTRACTOR, and CQA Subcontractor. Potentially acceptable procedures include:

- a. Patching, used to repair large holes, tears, undispersed raw materials, and contamination by foreign matter.
- b. Grinding and rewelding, used to repair small sections (typically with a maximum length of no more than several inches) of extruded seams.

- c. Spot welding or seaming used to repair pinholes or other minor, localized flaws.
- d. Capping, used to repair large lengths of failed seams.
- e. Topping, used to repair areas of inadequate seams, which have an exposed edge.
- f. Removing bad seam and replacing with a strip of new material welded into place, used with large lengths of fusion seams.

For repair methods, the following provisions shall be satisfied as applicable:

- a. Surfaces of the geomembrane that are to be repaired by extrusion welding shall be abraded no more than one hour prior to the repair.
- b. Surfaces shall be clean and dry at the time of the repair.
- c. Patches or caps shall extend at least 6 inches beyond the edge of the defect, and each corner of a patch or cap shall be rounded with a radius of at least 3 inches.
- d. The geomembrane below large caps shall be appropriately cut to avoid water or gas collection between the two sheets.

3.6.3 Verification of Repairs

Each repair shall be numbered and recorded. Each repair shall be nondestructively tested and recorded using the methods described in this Technical Specification. Large caps may be of sufficient extent to require destructive test sampling, at the discretion of the CQA Subcontractor. Repairs that fail nondestructive or destructive tests shall be redone and retested until a passing test is obtained. The CQA Subcontractor shall observe non-destructive testing of repairs and will record the number of each repair, date, and test results. CQA Subcontractor will determine if destructive samples are required on any repairs.

3.7 MATERIALS IN CONTACT WITH GEOMEMBRANE

Requirements of this section apply to geomembranes that are directly in contact with overlying soil or are covered with a layer of geotextile or geocomposite.

The requirements of this section are intended only to assure that the installation of other materials does not damage the geomembrane. Additional requirements as established in other sections of these specifications are to assure that systems built with these other materials are constructed in such a way as to provide proper performance.

3.7.1 Temperature

Do not place granular materials on the geomembrane at ambient temperatures below 32 degrees F or above 104 degrees F as measured 12 inches above the geomembrane surface.

3.7.2 Minimum Thickness

Equipment used for placing granular material shall not be driven directly on the geomembrane. A minimum thickness of 1 foot of granular material shall be maintained between placement equipment and the geomembrane. A minimum thickness of 3 feet of granular material shall be maintained between rubber-tired hauling vehicles and the geomembrane. Equipment and minimum material thicknesses shall be closely monitored to verify that no loads exceed a ground contact pressure of more than 5 psi measured 12 inches above the geosynthetics.

3.7.3 Spreading Equipment

Equipment used for placing or spreading granular material shall be as specified in 0600X-SP-C0078.

3.7.4 Spreading Operations

Equipment used for spreading granular material shall be as specified in 0600X-SP-C0078. Placement of operations layer soil materials on the geomembrane will not be allowed within 50 feet of any unseamed edge of geomembrane.

3.8 LINING SYSTEM ACCEPTANCE

The SUBCONTRACTOR shall retain ownership of and responsibility for the lining system until acceptance by the CONTRACTOR.

The geosynthetic lining system will be accepted by the CONTRACTOR when the following requirements have been satisfied:

- a. The installation is finished.
- b. Verification of the adequacy of field seams and repairs, including associated testing is complete.
- c. A written construction report, including "as built" drawings and installation documents and CQC documents have been prepared by the CQA Subcontractor, sealed by a registered professional engineer, and approved by the CONTRACTOR.
- d. The requirements of the GENERAL CONDITION titled FINAL INSPECTION AND ACCEPTANCE have been satisfied.

- e. SUBCONTRACTOR records, submittals, etc. are provided.

3.9 GEOTEXTILES

3.9.1 Installation Plan

The SUBCONTRACTOR shall submit a plan describing the proposed methods for geotextile unloading, storage, deployment, panel layout, seaming, testing, repair, and protection.

Materials and work that fail to meet the requirements of this specification section for geotextiles shall be removed and disposed of at the SUBCONTRACTOR's expense. This includes geotextile rolls that are not labeled or where the label has deteriorated to the point of being illegible.

3.9.2 Geotextile Handling and Placement

- a. Protective wrapping shall be removed less than 1-hour prior to unrolling the material.
- b. The SUBCONTRACTOR shall handle geotextiles in such a manner as to ensure that they are not damaged. Do not drag the geotextile across textured geomembrane. If necessary, use a smooth slip sheet under the textile. Position the geotextile after deployment and remove the slip sheet, if used.
- c. Place geotextiles in a manner that prevents folds and wrinkles. Folds or wrinkles shall be pulled smooth prior to seaming.
- d. In the presence of wind, exposed geotextiles shall be weighted with ultraviolet resistant sandbags or as approved. Sandbags shall be installed during placement and shall remain until replaced with cover material.
- e. Geotextiles shall be cut using an approved geotextile cutter only. Underlying geosynthetic materials shall not be damaged during cutting.
- f. During geotextile placement, stones, excessive dust, or moisture that could damage the geomembrane, clog drains or filters, or hamper subsequent seaming shall be removed.
- g. After installation, the geotextile shall be examined over its entire surface to ensure that no potentially harmful foreign objects, such as needles, rocks, debris, etc are present. Any foreign objects encountered shall be removed.
- h. Vehicles shall not be permitted on the geotextile unless approved by CONTRACTOR.

- i. If light colored geotextile is used, precautions shall be taken against "snow blindness" of personnel.
- j. After deployment, geotextile shall be covered to prevent exposure to ultraviolet (UV) radiation (sunlight) within a maximum period of 14 calendar days.

3.9.3 Seaming

- a. Geotextiles shall be overlapped a minimum 3 inches prior to seaming.
- b. Geotextiles shall be continuously sewn (i.e., spot sewing is not allowed). Alternatively, single or double wedge fusion welding will be acceptable. The CQA requirements for welding will be the same as for sewing. Leister welding (spot or continuous) will not be accepted as a replacement for sewing.
- c. No horizontal seams shall be allowed on side slopes (i.e., seams shall be along, not across, the slope) provided rolls can be manufactured of sufficient length, except as part of a patch.
- d. On the landfill floor, no horizontal seam shall be closer than 3 feet to the toe of the slope or other areas of potential stress concentrations unless authorized in writing by the CONTRACTOR.
- e. Areas to be seamed shall be clean and free of foreign material.
- f. Sewing shall be done using polymeric thread with chemical resistance properties equal to or exceeding those of the geotextile, or as approved by the CONTRACTOR. The manufacturer shall provide written certification that the thread complies with the specifications.
- g. Sewing shall be done using a sewing machine that creates a chain stitch. When entering and exiting a seam, the stitches shall be overlapped to prevent unraveling.
- h. SUBCONTRACTOR training and qualification procedures for sewing shall be submitted to the CONTRACTOR.

3.9.4 Geotextile Repair

Any holes or tears in the geotextile shall be repaired as follows:

- a. Remove any soil or other material that may have penetrated the torn geotextile.

- b. A patch made from the same geotextile shall be double seamed into place with the seams 1/4 inch to 3/4 inch apart and no closer than 1 inch from any edge. The patch shall extend at least 12 inches beyond the edges of the damaged area. Lyster welding may be used for geotextile patch repairs based on CONTRACTOR approval.

3.9.5 Materials in Contact with Geotextiles

The SUBCONTRACTOR shall place soil materials located on top of a geotextile in such a manner as to ensure that the following conditions are satisfied:

- a. No damage to the geotextile.
- b. Minimal slippage of the geotextile on underlying layers.
- c. No excess tensile stresses in the geotextile.

3.10 GEOCOMPOSITES

Materials and work that fail to meet the requirements of these specifications shall be removed, disposed of, and replaced at the SUBCONTRACTOR's expense.

3.10.1 Installation Plan

The SUBCONTRACTOR shall submit a plan describing the proposed methods for geocomposite unloading, storage, deployment, panel layout, seaming, testing, repair, and protection.

3.10.2 Handling and Placement

- a. Protective wrapping shall be removed less than 1-hour prior to unrolling.
- b. The SUBCONTRACTOR shall handle geocomposites in such a manner as to ensure that these materials are not damaged.
- c. Clean geomembrane surface prior to placing geocomposite to remove dust, dirt and debris.
- d. On slopes, geocomposite may be deployed over slip-sheets with the roll at the top of the slope. An alternative method is to secure the geocomposite and then roll it down slope in a manner to continually keep it in tension if necessary, position the geocomposite after deployment to minimize wrinkles and remove the slip sheet, if used.
- e. Do not drag the geocomposite across textured geomembrane.

- f. In the presence of wind, exposed geocomposites shall be weighted with ultraviolet resistant sandbags or equivalent. Sandbags shall be installed during geocomposite placement and shall remain until replaced with cover material.
- g. Unless otherwise specified, geocomposites shall not be welded to geomembranes.
- h. Geocomposites shall only be cut using approved cutting tool.
- i. The SUBCONTRACTOR shall take necessary precautions to prevent damage to underlying layers during placement of the geocomposite.
- j. During placement of geocomposites, care shall be taken not to entrap dirt or excessive dust that could cause clogging of the drainage system, and/or stones that could damage the adjacent geomembrane if dirt or excessive dust is entrapped in the geocomposite, it shall be cleaned prior to placement of the next material on top of it.
- k. Vehicles shall not be permitted on the geocomposite unless approved by CONTRACTOR.
- l. Tools shall not be left on or under the geocomposite.
- m. In geocomposites, tearing the geotextile away from the geonet shall not be allowed except at seam locations in corners as approved by the CQA Subcontractor.
- n. After deployment, geocomposite shall be covered to prevent exposure to ultraviolet (UV) radiation (sunlight) within a maximum period of 14 calendar days.

3.10.3 Joining

- a. Adjacent sections of geocomposite shall be overlapped according to manufacturer's directions.
- b. Overlaps shall be secured by tying. Acceptable tying devices include plastic fasteners, or polymer braid. Tying devices shall be white or yellow for easy observation. Metallic joining devices are not allowed.
- c. Overlaps shall be secured every 5 feet along slopes and on the floor of the landfill and every 6 inches in the anchor trenches. Along end-to-end seams, spot weld and tie 2 rows 3 inches apart. Spot weld and tie each row at 6 inch intervals; stagger weld or ties between rows.

- d. No horizontal seams shall be allowed on side slopes provided rolls can be manufactured to sufficient length. If required because of manufacturing limitation end seams shall be staggered.
- e. If more than one layer of geocomposite is installed, joints shall be staggered.
- f. Top geotextile component of the geocomposite shall be sewn.

3.10.4 Repair

Generally holes or tears in the geonet shall be repaired by placing a patch extending 2 feet beyond the edges of the hole or tear. Ribs in the patch shall be parallel to ribs in the existing geonet. The patch shall be secured to the original geonet by spot welding or tying every 6 inches using tying devices as indicated above. If the hole or tear width across the roll is more than 50 percent the width of the roll, the damaged area shall be cut out and the two portions of the geonet shall be joined as described in the specifications.

- a. Remove the damaged or unbonded area of geocomposite.
- b. Cut a piece of geocomposite to fit over the repair area. Geocomposite shall fit over repair area and shall be tied similar to end to end seams.
- c. Remove any dirt or other foreign material that may have entered the geocomposite.
- d. Geocomposite damage greater than 4 square feet shall require removal of full roll width of damaged area.

3.10.5 Materials in Contact with Geocomposites

The SUBCONTRACTOR shall place soil materials located on top of a geocomposite layer in such a manner as to ensure that the following conditions are satisfied:

- a. No damage to the geocomposite.
- b. No slippage of the geocomposite on underlying layers.
- c. No excess tensile stresses in the geocomposite.

Placement of soil materials shall begin at the bottom of side slopes and progress upslope or laterally at about the same elevation such that a full layer of material is covering the geosynthetics downslope from the area being covered.

3.11 GEOSYNTHETIC PENETRATIONS

Geosynthetic penetrations shall be installed per ASTM D6497.

3.12 QUALITY ASSURANCE/QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

Records shall include, but not be limited to the following:

- (1) Calibration of seaming and testing equipment. Calibration shall be at manufacturers' recommended intervals or whenever rough handling, damage, or other factors indicate that accuracy may have been compromised. Methods used for calibration shall conform to manufacturers' recommendations. Secondary standards shall be traceable to national standards.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory shall be furnished to the CONTRACTOR within one working day following the inspection or test.

Table 1
High Density Polyethylene (HDPE) Geomembrane – 60 mil Textured

Properties	Test Method	Manufacturer QC Test Frequency	Required Test Values
Thickness (min. avg.) • Minimum individual	ASTM D5994	1 per Roll	60 mil 57 mil
Asperity Height (min. avg.) ⁽¹⁾	ASTM D7466	1 per 50,000 ft ²	20 mil
Sheet Density (min)	ASTM D792 or ASTM D1505	1 per 50,000 ft ²	0.940 g/cc
Tensile Properties ⁽²⁾ (min. avg.) • Yield strength • Break strength • Yield elongation • Break elongation	ASTM D6693	1 per 50,000 ft ²	126 lb/in 90 lb/in 12% 100%
Tear Resistance (min. avg.)	ASTM D1004 Die C	1 per 50,000 ft ²	42 lbs
Puncture Resistance (min. avg.)	ASTM D4833	1 per 50,000 ft ²	90 lbs
Stress Crack Resistance ⁽³⁾	ASTM D5397 (App.)	(11)	300 hours
Carbon Black Content (range)	ASTM D1603 ⁽⁴⁾	1 per 50,000 ft ²	2-3%
Carbon Black Dispersion ⁽⁵⁾	ASTM D5596	1 per 50,000 ft ²	Category 1,2, or 3 ⁽⁵⁾
Oxidative Induction Time (OIT) (min. avg.) ⁽⁶⁾ • Std. OIT, or • High Pressure OIT	ASTM D3895 ASTM D5885	(11)	100 min. 400 min
Oven Aging at 85 C ⁽⁶⁾⁽⁷⁾ • Std OIT (min. avg.), % retained after 90 days, or • High Pressure OIT (min. avg.), % retained after 90 days	ASTM D5721 ASTM D3895 ASTM D5885	(11)	55% 80%
UV Resistance ⁽⁸⁾ • Std. OIT (min. avg.), or • High Pressure OIT (min. avg.) % retained after 1600 hrs ⁽¹⁰⁾	GRI GM -11 ASTM D3895 ASTM D5885	(11)	(9) 50%

- (1) Alternate the measurement side for double sided textured sheet
- (2) Machine direction (MD) and cross machine direction (XMD) average values shall be on the basis of 5 test specimens each direction.
 - Yield elongation is calculated using a gage length of 1.3 inches
 - Break elongation is calculated using a gage length of 2.0 inches.
- (3) The SP-NCTL test is not appropriate for testing geomembranes with textured or irregular rough surfaces. Test shall be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheet materials.
- (4) Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.
- (5) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
 - 9 in Categories 1 or 2, and
 - 1 in Category 3.
- (6) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
- (7) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
- (8) The condition of the test shall be 20 hr. UV cycle at 75 C followed by 4 hr. condensation at 60 C.
- (9) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
- (10) UV resistance is based on percent retained value regardless of the original HP-OIT value.
- (11) Manufacturer may provide certification letter per resin formulation.

TABLE 2
High Density Polyethylene (HDPE) Geomembrane 100 Mil Smooth

Properties	Test Method	Manufacturer QC Test Frequency	Required Test Values
Thickness (min. avg.) • Minimum individual	ASTM D5199	1 per Roll	100 mil 97 mil
Sheet Density (min)	ASTM D792 or ASTM D1505	1 per 50,000 ft ²	0.940 g/cc
Tensile Properties ⁽¹⁾ (min. avg.) • Yield strength • Break strength • Yield elongation • Break elongation	ASTM D6693	1 per 50,000 ft ²	210lb/in 380 lb/in 12% 700%
Tear Resistance (min. avg.)	ASTM D1004 Die C	1 per 50,000 ft ²	70 lbs
Puncture Resistance (min. avg.)	ASTM D4833	1 per 50,000 ft ²	180 lbs
Stress Crack Resistance ⁽²⁾	ASTM D5397 (App.)	(10)	300 hours
Carbon Black Content (range)	ASTM D1603	1 per 50,000 ft ²	2-3%
Carbon Black Dispersion ⁽⁴⁾	ASTM D5596	1 per 50,000 ft ²	Category 1,2, or 3 ⁽⁴⁾
Oxidative Induction Time (OIT) (min. avg.) ⁽⁵⁾ • Std. OIT, or • High Pressure OIT	ASTM D3895 ASTM D5885	(10)	100 min. 400 min.
Oven Aging at 85 C ⁽⁵⁾⁽⁶⁾ • Std OIT (min. avg.), % retained after 90 days or • High Pressure OIT (min. avg.), % retained after 90 days	ASTM D5721 ASTM D3895 ASTM D5885	(10)	55% 80%
UV Resistance ⁽⁷⁾ • Std. OIT (min. avg.), or • High Pressure OIT (min. avg.) % retained after 1600 hrs ⁽⁹⁾	GRI GM -11 ASTM D3895 ASTM D5885	(10)	(8) 50%

- (1) Machine direction (MD) and cross machine direction (XMD) average values shall be on the basis of 5 test specimens each direction.
 - Yield elongation is calculated using a gage length of 1.3 inches
 - Break elongation is calculated using a gage length of 2.0 inches.
- (2) The yield stress used to calculate the applied load for the SP_NCTL test shall be the manufacturer's mean value.
- (3) Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.
- (4) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
 - 9 in Categories 1 or 2, and
 - 1 in Category 3.
- (5) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
- (6) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
- (7) The condition of the test shall be 20 hr. UV cycle at 75 C followed by 4 hr. condensation at 60 C.
- (8) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
- (9) UV resistance is based on percent retained value regardless of the original HP-OIT value.
- (10) Manufacturer may provide certification letter per resin formulation.

**TABLE 3
REQUIRED SEAM PROPERTIES**

PROPERTY	QUALIFIER	UNIT	SPECIFIED VALUE ⁽¹⁾		TEST METHOD
<u>Physical Properties – Hot Wedge Seams</u>					
Thickness	Nominal	Mils	60	100	
Shear Strength ⁽²⁾⁽¹⁾ (at yield point)	Minimum	Lb/in width	120 FTB ⁽³⁾⁽²⁾	200 FTB	ASTM D6392
Peel Adhesion	Minimum	Lb/in width	91	151	ASTM D6392
			FTB	FTB	ASTM D6392
<u>Physical Properties – Extrusion Seams</u>					
Thickness	Nominal	Mils	60	100	
Shear Strength ⁽²⁾⁽¹⁾ (at yield point)	Minimum	Lb/in width	120 FTB ⁽³⁾⁽²⁾	200 FTB	ASTM D6392
Peel Adhesion ⁽⁴⁾	Minimum	Lb/in width	78 FTB	130 FTB	ASTM D6392

- (1) Destructive testing shall meet specified values for all testing. Values from GRIGM-19
(2) Also called “Bonded Seam Strength”.
(3) FTB = Film Tear Bond (failure occurs through intact geomembrane, not through seam).
(4) No more than 25% of the seam width can separate (peel) to be considered a passing specimen.

**TABLE 4
REQUIRED GEOTEXTILE PROPERTIES**

PROPERTY	UNIT	VALUE ^(a)		MQC Test Frequency	TEST METHOD
		TYPE A	TYPE B		
Thickness	Mils	80	155	Every 50,000 ft ² Per Lot	ASTM D1777 or D5199
Mass/Unit Area	oz/yd ²	8	16	Every 50,000 ft ² Per Lot	ASTM D5261
Apparent Opening Size ^{(b)(c)}	U.S. Sieve	70 Max Opening 100 Min Opening		Every 50,000 ft ² Per Lot	ASTM D4751
Grab Strength	Lb	220	390	Every 50,000 ft ² Per Lot	ASTM D4632
Trapezoidal Tear Strength	Lb	95	150	Every 50,000 ft ² Per Lot	ASTM D4533
Puncture Strength	Lb	120	240	Every 50,000 ft ² Per Lot	ASTM D4833
Permittivity ^(c)	sec ⁻¹	1.5		Every 50,000 ft ² Per Lot	ASTM D4491
UV Resistance (500 hours)	% strength retained	>70	>70	Annually per each formulation ^(d)	ASTM D4355

- Notes: (a) All values are minimum average roll values.
 (b) Out-of-range values will be reviewed and can be approved by the CONTRACTOR on a case-by-case basis.
 (c) Not Required for Cushion Geotextile (Type B)
 (d) Manufacturer's annual UV testing on the material formulations for the products provided for the project.

**TABLE 5
REQUIRED GEONET PROPERTIES**

PROPERTY	GEONET			
	QUALIFIER	UNIT	VALUE	TEST
Mass per Unit Area	MARV ⁽¹⁾	oz/yd ⁽²⁾	24	ASTM D5261
Polymer specific gravity	Minimum	N/A	0.94	ASTM D1505
Polymer melt index	Range	g/10 min	0.1-1.1	ASTM D1238
Carbon black content	Range	%	2 - 3	ASTM D1603 or D4218
Thickness	MARV ⁽¹⁾	Mils	200 ⁽²⁾	ASTM D1777 or D5199

Notes:

- (1) MARV = Minimum Average Roll Value.
 (2) Represents minimum value, a thicker geonet may be required to meet transmissivity requirement of geocomposite.

**TABLE 6
REQUIRED GEOCOMPOSITE PROPERTIES**

TYPE A GEOCOMPOSITE				
PROPERTY	QUALIFIER	UNIT	VALUE	TEST
Transmissivity ⁽²⁾⁽³⁾	MARV ⁽¹⁾	m ² /sec	1 x 10 ⁻³	ASTM D4716
Ply Adhesion ⁽⁴⁾	Minimum	lb/in	1.0	ASTM D7005

Notes:

- (1) MARV = Minimum Average Roll Value.
- (2) Measured using water at 20°C (68°F) with a gradient of 0.1, under a compressive stress of 479 kPa (10,000 psf) between two smooth steel plates.
- (3) Certify there are no un-bonded areas for the geotextile to geonet, except for along panel edges.

CELL CONSTRUCTION – LEACHATE COLLECTION SYSTEMS AND LYSIMETERS CONTENTS

1.0	GENERAL.....	3
1.1	SUMMARY.....	3
1.2	ABBREVIATIONS.....	3
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS.....	3
1.4	TECHNICAL SUBMITTALS.....	4
	1.4.1 Drainage Gravel Placement Plan.....	4
	1.4.2 Operations Layer Placement Plan.....	4
1.5	DESCRIPTION.....	5
	1.5.1 Drainage Gravel.....	5
	1.5.2 Operations Layer.....	5
2.0	MATERIALS AND EQUIPMENT.....	5
2.1	DRAINAGE GRAVEL.....	5
	2.1.1 Applicability.....	5
	2.1.2 Durability.....	5
	2.1.3 Permeability.....	5
	2.1.4 Samples.....	6
2.2	DRAINAGE GRAVEL TYPE A.....	6
2.3	DRAINAGE GRAVEL TYPE B.....	6
2.4	DRAINAGE GRAVEL TYPE C.....	6
2.5	OPERATIONS LAYER MATERIAL.....	6
	2.5.1 Composition.....	6
	2.5.2 Particle Size.....	6
	2.5.3 Compactability.....	6
	2.5.4 Samples.....	6
3.0	EXECUTION.....	6
3.1	GENERAL.....	6
	3.1.1 Unacceptable Materials and Work.....	6
3.2	MATERIALS IN CONTACT WITH GEOSYNTHETICS.....	6
	3.2.1 Temperature.....	6
	3.2.2 Minimum Thickness.....	6
	3.2.3 Hauling Equipment.....	6
	3.2.4 Spreading Equipment.....	6
	3.2.5 Spreading Operations.....	6
	3.2.6 Materials in Contact with Geocomposites.....	6
	3.2.7 CONTRACTOR Testing.....	6
3.3	DRAINAGE GRAVEL PLACEMENT PLAN.....	6
	3.3.1 Drainage Gravel Placement.....	6
	3.3.2 Compaction.....	6
	3.3.3 Protection.....	6
3.4	OPERATIONS LAYER PLACEMENT PLAN.....	6
	3.4.1 Operations Layer Placement.....	6
	3.4.2 Compaction.....	6
	3.4.3 Protection.....	6
3.5	CONSTRUCTION QUALITY CONTROL.....	6

CELL CONSTRUCTION – LEACHATE COLLECTION SYSTEMS AND LYSIMETERS

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for the Leachate Collection System, Lysimeters, and Operation Layer of the Environmental Restoration Disposal Facility (ERDF) Cells 9 & 10.

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
CQA	Construction Quality Assurance
CQC	Construction Quality Control
EPA	Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
HDPE	High Density Polyethylene
IWCP	Integrated Work Control Program
QAP	Quality Assurance Plan
SSRS	Subcontractor/Supplier Submittal Requirements Summary

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS.

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Leachate Collection System Construction. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Cell Construction. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2,700 kNm/m ³))
ASTM D2434	Standard Test Method for Permeability of Granular Soils (Constant Head)

ASTM D4373	Standard Test Method for Rapid Determination of Carbonate Content of Soils
ASTM D4644	Standard Test Method for Slake Durability of Shales and Similar Weak Rocks
ASTM D5321	Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method.
EPA/600/R-93/182	Quality Assurance and Quality Control for Waste Containment Facilities*
WAC 173 216	State Waste Discharge Permit Program
WAC 173 400	General Regulations for Air Pollution Sources

Washington DOT Standard Specification

* Note that an update to EPA/600/R-93/182 has been published: Daniel, D.E. and Koerner, R. M. (2007). *Waste Containment Facilities: Guidance for Construction Quality Assurance and Construction Quality Control of Liner and Cover Systems*, second ed., ASCE, New York, NY, 351 pp.

1.4 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.4.1 Drainage Gravel Placement Plan

The SUBCONTRACTOR shall submit a placement plan describing the proposed methods and equipment for drainage gravel manufacturing or supply; delivery; stockpiling; testing; placement; compaction; and as-built surveying. The plan shall include a quality control program for the SUBCONTRACTOR's activities related to the protection of adjacent pipes, geosynthetic layers and installation activities (inspections, measurements, materials, etc.). Ground contact pressures for the equipment used to place the gravel will also be included in the SUBCONTRACTOR's plan.

1.4.2 Operations Layer Placement Plan

The SUBCONTRACTOR shall submit a placement plan describing the proposed borrow source, methods, and equipment for operations layer placement, testing, compaction, and as-built surveying. The plan shall include a quality control program for the SUBCONTRACTOR's activities related to the protection of adjacent pipes, geosynthetic layers and installation activities (inspections, measurements, materials, etc.).

1.5 DESCRIPTION

This section includes the work for furnishing and installing the Drainage Gravel, and Operations Layer. The high density polyethylene (HDPE) pipe used as leachate collection piping on floor, cleanout access pipe on the slope, and sideslope sump riser pipes are included in specifications 0600X-SP-M0032 and 0600X-SP-M0033.

1.5.1 Drainage Gravel

This work consists of the supply and installation of gravel for the drainage layers and sumps in the ERDF cells.

1.5.2 Operations Layer

This work consists of the supply and installation of soil for the operations layer in the ERDF cells.

2.0 MATERIALS AND EQUIPMENT

Drainage gravel may be obtained from Pit 30 located north of the Construction Access Road approach on Route 3 as shown on Exhibit "F" drawings. Material from Pit 30 shall be excavated (existing stockpiles shall not be used) and processed to manufacture gravel meeting the specifications. SUBCONTRACTOR is responsible for traffic control and removal of mud, rocks, and debris across Route 3 during transport of gravel from Pit 30 to the project site.

2.1 DRAINAGE GRAVEL

2.1.1 Applicability

The following specifications apply to gravel in the primary and secondary leachate collection systems and the lysimeters.

2.1.2 Durability

Gravel shall consist of rounded material that is mechanically stable and chemically inert. In general, hard rock types such as basalt and granite are preferred; siltstones, mudstones, and carbonate rocks are not acceptable. The SUBCONTRACTOR shall perform carbonate content tests (ASTM D4373) on the gravel samples. A loss in weight of less than 3% will be considered acceptable.

2.1.3 Permeability

Gravel shall exhibit a permeability of 1×10^{-2} cm/sec or greater (ASTM D2434).

2.1.4 Samples

Submit gravel samples to the CONTRACTOR a minimum of two weeks prior to full scale production for testing in accordance with the CQA Plan.

2.2 DRAINAGE GRAVEL TYPE A

Type A gravel shall be used for drainage layers outside of the sump area. This material shall consist of rounded gravel meeting the following gradation requirements:

U.S. Sieve Size	% Passing
1-1/2 in.	100
1 in.	70-100
3/4 in.	60-100
3/8 in.	35-80
No. 4	10-40
No. 40	0-10
No. 100	0-4
No. 200	0-4

2.3 DRAINAGE GRAVEL TYPE B

Type B gravel shall be used for drainage inside of the primary and secondary sumps. This material shall consist of well-rounded gravel and meet the gradation requirements of Washington DOT standard specification 9-03.12(4) (ASTM C136)

U.S. Sieve Size	% Passing
1 in.	100
3/4 in.	80-100
3/8 in.	0-40
No. 4	0-4
No. 200	0-2

2.4 DRAINAGE GRAVEL TYPE C

Type C gravel shall be used for drainage inside of the lysimeter sump area. This material shall consist of crushed gravel meeting the following gradation requirements (ASTM C136):

U.S. Sieve Size	% Passing
1-1/2 in.	100
1 in.	70-100
3/4 in.	60-100
3/8 in.	35-80
No. 4	20-60
No. 40	0-10
No. 100	0-4
No. 200	0-4

2.5 OPERATIONS LAYER MATERIAL

Operations layer material shall consist of native, non-organic, granular soil derived from approved on-site sources with following USCS classifications: GM, GP, SW, SM, and SP, or as approved by the CONTRACTOR.

2.5.1 Composition

Soils shall be free of roots, wood, peat, cinders, frozen material, rubbish, or other deleterious material.

2.5.2 Particle Size

Soils shall have a maximum particle size of 4 inches, provided large particles are in soil matrix (ASTM D422).

2.5.3 Compactability

Trench floor operations layer material shall be capable of being moisture conditioned and compacted to at least 90% of the maximum dry density as determined by the standard Proctor test (ASTM D698).

2.5.4 Samples

Submit samples a minimum of two weeks prior to full scale production for testing in accordance with the CQA Plan.

3.0 EXECUTION

3.1 GENERAL

3.1.1 Unacceptable Materials and Work

Materials and work that fail to meet the requirements of these specifications shall be removed and disposed of at the SUBCONTRACTOR's expense. Repair/replacement shall be at the SUBCONTRACTOR's expense.

3.2 MATERIALS IN CONTACT WITH GEOSYNTHETICS

Requirements of this section apply to geomembranes that are directly in contact with overlying soil or are covered with a layer of geotextile or geocomposite.

The requirements of this section are intended to assure that the installation of other materials does not damage the geomembrane. Additional requirements as established in the Subcontract are to assure that systems built with these other materials are constructed in such a way as to provide proper performance.

3.2.1 Temperature

Do not place granular materials on the geosynthetics at ambient temperatures below 32 degrees F or above 104 degrees F unless otherwise specified.

3.2.2 Minimum Thickness

Equipment used for placing granular material shall not be driven directly on the geosynthetics. A minimum thickness of 1 foot of granular material shall be maintained between placement equipment and the geosynthetics. A minimum thickness of 3 feet of granular material shall be maintained between rubber-tired hauling vehicles and the geosynthetics.

Equipment and minimum material thicknesses shall be closely monitored to verify that no loads exceed a ground contact pressure of more than 5 psi measured 12 inches above the geosynthetics. SUBCONTRACTOR shall submit equipment loading calculations demonstrating equipment loadings do not exceed 5 psi measured 12 inches above the geosynthetics.

The SUBCONTRACTOR shall survey the alignment and extents of access roads used to transport drainage gravel and operations layer materials over the liner system.

3.2.3 Hauling Equipment

No articulated trucks shall be used to haul granular material above the geosynthetics. Hauling operations above any geosynthetics shall be monitored to verify that appropriate material thicknesses are maintained.

3.2.4 Spreading Equipment

Equipment used for spreading material above any geosynthetics shall be a light ground pressure dozer with less than 5 psi contact pressure, or other equipment as approved.

3.2.5 Spreading Operations

Placement equipment operating on materials above geosynthetics shall not spin their wheels, make sharp turns, or make sharp, rapid stops. Good operating practice shall be used by spreading equipment. Specifically, no sharp turns, any abrupt starting or stopping, and no heavy loads using excavators. Materials shall be pushed carefully in an upward tumbling action from previously placed material and not dumped directly onto geosynthetics. Placement and spreading operations shall be continuously monitored by the SUBCONTRACTOR and the CONTRACTOR. The SUBCONTRACTOR will provide one spotter, or ground person, for each piece of equipment in operation. Since all geomembrane edges will be seamed, placement of soil materials on the geomembrane will not be allowed within 50 feet of any unseamed edge of geomembrane.

3.2.6 Materials in Contact with Geocomposites

The SUBCONTRACTOR shall place granular materials and HDPE riser pipes located on top of a geocomposite layer in such a manner as to ensure that the following conditions are satisfied:

- a. No damage to the geocomposite.
- b. No slippage of the geocomposite on underlying layers.
- c. No excess tensile stresses in the geocomposite.

3.2.7 CONTRACTOR Testing

After installation of the primary drainage aggregate layer is complete, the CONTRACTOR may perform testing in the access road areas to verify that the underlying liner system was not damaged during construction. The testing will take 2-3 weeks to complete and the primary drainage layer shall not be covered until directed by the CONTRACTOR.

3.3 DRAINAGE GRAVEL PLACEMENT PLAN

Submit a plan describing the manufacturing or supply, delivery, stockpiling, testing, placement, production, compaction, and as-built survey procedures for drainage gravel placement.

3.3.1 Drainage Gravel Placement

- a. Load, handle, and place drainage gravel using equipment and methods that will minimize generation of fines.

- b. Place gravel over lysimeter, secondary and primary geosynthetic materials across base of landfill, and in sumps as shown on Drawings.
- c. Spread gravel layers with low ground pressure spreading equipment as specified.
- d. Hauling and placing equipment shall operate on a minimum of 3 feet of granular material above any geosynthetic layer. Grading equipment shall operate on no less than 1 foot of gravel over any geosynthetic layer. In all cases, equipment and minimum material thicknesses shall be closely monitored to verify that no loads exceed a ground contract pressure of more than 5 psi measured 12 inches above the geosynthetics.
- e. The alignment of the leachate collection pipe shall be maintained until covered with drainage gravel.

3.3.2 Compaction

Drainage gravel shall be track walked in 1 foot thick lifts by spreading equipment. Type C crushed drainage gravel shall be compacted to 90 percent of the maximum dry density as determined by ASTM D698.

3.3.3 Protection

- a. Protect sump pipes, side slope riser pipes, perforated drain pipes, and other pipes and structures from damage.
- b. Do not use dozer or other vehicle to compact granular material within 1.5 feet of perforated drain or collector pipes. In these locations, compact with a walk-along vibratory roller, powertamper, or other means approved by CONTRACTOR after full thickness of granular material has been placed.
- c. Protect underlying geosynthetics from damage. Drainage gravel shall be pushed carefully from previously placed material and not dumped directly onto geosynthetics.
- d. The SUBCONTRACTOR shall take steps to minimize wrinkle generation in underlying geosynthetic materials during placement of the drainage gravel. The measures may include placing gravel in the early morning hours when the geosynthetic materials are cool and monitoring and walking out wrinkles in the geosynthetic materials that appear at the edge of the placement area.
- e. Do not place gravel over geomembrane or geosynthetics that have a "trampoline" effect due to low temperature shrinkage to prevent tearing seams. Allow liner material to warm and lay flat on substrate material before continuing spread of gravel layer.

3.4 OPERATIONS LAYER PLACEMENT PLAN

Submit a plan describing the manufacturing or supply, delivery, stockpiling, testing, placement, production, compaction, and as-built survey procedures for the operations layer.

3.4.1 Operations Layer Placement

- a. Place operations layer over geosynthetic materials on base and side slopes of landfill as shown on Drawings. Place and compact in one lift to minimize potential damage to the liner.
- b. Do not place operations layer until final inspection of geosynthetics by the CONTRACTOR has been made to verify that conditions stated in the CQA Plan are satisfied.
- c. Hauling and placing equipment shall operate on a minimum of 3 feet of operations material above any geosynthetic layer.
- d. Grading equipment shall operate on no less than 3 feet of material over any geosynthetic layer. In all cases, equipment and minimum material thicknesses shall be closely monitored to verify that no damage is done to the underlying liner system and no loads exceed a ground contact pressure of more than 5 psi measured 12 inches above the geosynthetics.
- e. Operations layer material placed on the side slopes shall be pushed up from the bottom of the slope.
- f. In locations where heat seaming has been used to join geotextile sections, the operations layer shall be spread in the same direction as the seam overlap to avoid placing additional stress on the seam.

3.4.2 Compaction

The finished surface of the operations layer on the trench floor shall be compacted to 90% of the maximum dry density as determined by the standard Proctor test (ASTM D698) and shall be capable of supporting rubber-tired vehicles with minimum degradation to the working surface.

3.4.3 Protection

- a. Protect underlying geosynthetics from damage.
- b. The SUBCONTRACTOR shall take steps to minimize wrinkle generation in underlying geosynthetic materials during placement of the operations layer. The measures may include placing operations layer material in the early morning hours when the geosynthetic materials are cool, and monitoring and walking out

wrinkles in the geosynthetic materials that appear at the edge of the placement area.

- c. Avoid placement of operations layer soils over any area of geomembrane with "trampoline" effect. Allow liner to warm and lay flat on substrate before continuing spreading operation.

3.5 CONSTRUCTION QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Control Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

- (1) Control of overall drainage gravel layer thickness. Drainage gravel elevations shall be determined by the CQA Subcontractor's surveyor on a minimum 50 foot grid and at grade breaks over the floor and side slopes of the disposal trench except that detailed surveying shall be required in the sump area and other locations to establish grade breaks and slope continuity as directed by the CONTRACTOR. Vertical survey accuracy shall be plus or minus 0.05 feet or better. Results shall be provided to the CONTRACTOR. No liner materials shall be installed on the finished surface until satisfactory thickness of the drainage layer has been verified.
- (2) Control of overall operations layer thickness. Operations layer elevations shall be determined by the CQA Subcontractor's surveyor on a minimum 50 foot grid and at grade breaks over the floor and side slopes of the disposal trench except that detailed surveying shall be required in the sump area and other locations to establish grade breaks and slope continuity as directed by the CONTRACTOR. Vertical survey accuracy shall be plus or minus 0.05 feet or better. Results shall be provided to the CONTRACTOR.

Copies in duplicate of these surveys, records and other test results, as well as records of corrective actions taken to obtain satisfactory installations and satisfactory results, shall be furnished to the CONTRACTOR within one working day following the inspection, survey, or test.

REINFORCED CONCRETE

CONTENTS

1.0	GENERAL.....	5
1.1	SUMMARY.....	5
1.2	ABBREVIATIONS	5
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS	5
1.4	TECHNICAL SUBMITTALS.....	8
	1.4.1 Shop Drawings.....	8
	1.4.2 Mix Design.....	8
	1.4.3 Testing.....	8
1.5	GENERAL REQUIREMENTS.....	8
	1.5.1 Strength Requirements.....	8
	1.5.2 Air Entrainment	9
	1.5.3 Special Properties.....	9
	1.5.4 Slump.....	9
1.6	PROPORTIONS OF MIX	9
	1.6.1 Mixture Proportioning, Normal Weight Concrete.....	9
	1.6.2 Average Strength	10
1.7	STORAGE OF MATERIALS	10
2.0	PRODUCTS.....	10
2.1	ADMIXTURES	10
	2.1.1 Accelerating Admixture.....	10
	2.1.2 Air-Entraining Admixture.....	10
	2.1.3 High Range Water Reducer Admixture (Superplasticizers).....	10
	2.1.4 Water-Reducing or Retarding Admixture.....	11
2.2	CEMENTITIOUS MATERIALS	11
	2.2.1 Cement: ASTM C150/C150M, Type I or II.....	11
	2.2.2 Portland-Pozzolan Cement: ASTM C595/C595M, Type IP.....	11
	2.2.3 Fly Ash: ASTM C618, Class F.....	11
	2.2.4 Ground Granulated Blast Furnace Slag (GGBFS):.....	11
2.3	AGGREGATES.....	11
	2.3.1 Normal Weight Aggregate.....	11
2.4	CURING MATERIALS	11
	2.4.1 Burlap.....	11
	2.4.2 Impervious Sheets.....	11
	2.4.3 Membrane-Forming Compounds.....	12
2.5	EMBEDDED ITEMS	12
2.6	NONSHRINK GROUT	12
2.7	WATER	12
2.8	CONCRETE REINFORCEMENT.....	12
	2.8.1 Reinforcing Steel	12
	2.8.2 Wire Ties.....	12

	2.8.3	Supports	12
2.9		FORM MATERIALS	13
	2.9.1	Forms For Class A and Class B Finish	13
	2.9.2	Forms For Class C Finish	13
	2.9.3	Form Ties	13
	2.9.4	Form Releasing Agents	13
3.0		EXECUTION	13
3.1		PREPARATION OF SURFACES	13
	3.1.1	Foundations	14
	3.1.2	Preparation of Previously Placed Concrete	14
3.2		INSTALLATION OF EMBEDDED ITEMS	14
3.3		BATCHING, MIXING AND TRANSPORTING CONCRETE	14
	3.3.1	Admixtures	14
	3.3.2	Control of Mixing Water	14
3.4		SAMPLING AND TESTING	15
	3.4.1	Aggregates	15
	3.4.2	Sampling of Concrete	15
	3.4.3	Evaluation and Acceptance of Concrete	15
	3.4.4	Investigation of Low-Strength Test Results	16
3.5		CONVEYING CONCRETE	16
	3.5.1	Chutes	16
	3.5.2	Buckets	17
	3.5.3	Belt Conveyors	17
	3.5.4	Pumps	17
3.6		CONCRETE PLACEMENT	17
	3.6.1	Placing Operation	17
	3.6.2	Consolidation	18
	3.6.3	Cold Weather Requirements	18
	3.6.4	Hot Weather Requirements	18
3.7		CONSTRUCTION JOINTS	19
3.8		FINISHING CONCRETE	19
	3.8.1	Formed Surfaces	19
	3.8.2	Unformed Surfaces	20
3.9		CURING AND PROTECTION	21
	3.9.1	General	21
	3.9.2	Moist Curing	21
	3.9.3	Membrane Curing	21
3.10		SETTING BASE PLATES AND BEARING PLATES	22
	3.10.1	Damp-Pack Bedding Mortar	22
	3.10.2	Nonshrink Grout	22
	3.10.3	Treatment of Exposed Surfaces	22
3.11		REINFORCEMENT	22
	3.11.1	Placement	23
	3.11.2	Splicing	23
3.12		CONCRETE FORMWORK	23

3.12.1	Storage and Handling.....	23
3.12.2	Formwork.....	23
3.12.3	Chamfering	24
3.12.4	Coating.....	24
3.12.5	Removal of Forms.....	24
3.13	CONSTRUCTION QUALITY CONTROL.....	25

REINFORCED CONCRETE

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for Reinforced Concrete.

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

ACI	American Concrete Institute
AHA	American Hardboard Association
ASTM	American Society for Testing and Materials
CQC	Construction Quality Control
CRSI	Concrete Reinforcing Steel Institute
DOC	Department Of Commerce
FS	Federal Specifications
NRMCA	National Ready-Mixed Concrete Association
QAP	Quality Assurance Program
SSRS	Subcontractor/Supplier Submittal Requirements Summary

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Reinforced Concrete. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Reinforced Concrete. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ACI 117	Specifications for Tolerances for Concrete Construction and Materials
ACI 211.1	Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 301	Specifications for Structural Concrete for Buildings
ACI 304	Guide for Measuring, Mixing, Transporting and Placing Concrete
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting

ACI 318/318R	Building Code Requirements for Structural Concrete
ACI 347R	Guide to Formwork for Concrete
AHA A135.4	Basic Hardboard
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A675	Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C78	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)
ASTM C143/C143M	Standard Test Method for Slump of Hydraulic Cement Concrete
ASTM C150/C150M	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173/C173M	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C192/C192M	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494/C494M	Standard Specification for Chemical Admixtures for Concrete
ASTM C578	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM C591	Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
ASTM C595/C595M	Standard Specification for Blended Hydraulic Cements
ASTM C597	Standard Test Method for Pulse Velocity through Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C803/C803M	Standard Test Method for Penetration Resistance of Hardened Concrete
ASTM C805/C805M	Standard Test Method for Rebound Number of Hardened Concrete
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017/C1017M	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1107/C1107M	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM D98	Standard Specification for Calcium Chloride
ASTM E96/E96M	Standard Test methods for Water Vapor Transmission of Materials
CRSI MSP-1	Concrete Reinforcing Steel Institute, Manual of Standard Practice
DOC PS 1-95	Construction and Industrial Plywood
FS CCC-C-467	Cloth, Burlap, Jute (or Kenaf)

- NRMCA CPMB 100 Concrete Plant Standards
- NRMCA QC 3 Quality Control Manual: Section 3, Plant Certifications Checklist:
Certification of Ready-Mixed Concrete Production Facilities
- NRMCA TMMB Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards

1.4 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS) Submittals that do not meet requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.4.1 Shop Drawings

Detail drawings showing reinforcing steel schedules, sizes, grades, and splicing and bending details. Drawings shall show support details including types, sizes and spacing.

1.4.2 Mix Design

The Mix Design shall comply with the requirements of ACI 318. If production facility strength records are utilized as basis for mix design the data shall be submitted. If a new mix design is formulated the mix design records and test results shall be submitted. Batch weights, constituents, suppliers, and quality control data shall be submitted for each concrete mix design. Mix design submittals shall be submitted at least 14 days prior to commencing concrete placing operations. Aggregate weights shall be based on the saturated surface dry condition.

1.4.3 Testing

Submit copies of test reports.

1.5 GENERAL REQUIREMENTS

Tolerances for concrete construction and materials shall be in accordance with ACI 117.

1.5.1 Strength Requirements

Structural concrete shall have a 28-day compressive strength of 4000 psi. Concrete made with high-early strength cement shall have a 7-day strength equal to the specified 28-day strength for concrete made with Type I or II portland cement.

1.5.2 Air Entrainment

Concrete shall contain from 5 to 7 percent total air, except where hard trowel finish is planned where the air content shall be less than 3 percent.

1.5.3 Special Properties

Concrete may contain other admixtures, such as water reducers, superplasticizers, or set retarding agents to provide special properties to the concrete, if approved by the CONTRACTOR.

1.5.4 Slump

Slump shall be within the following limits:

<u>Structural Element</u>	<u>Slump in inches</u>	
	<u>Minimum</u>	<u>Maximum</u>
Walls, columns and beams 4 in.	2 in.	4 in.
Foundation walls, substructure walls, footings, pavement, and slabs	2 in.	4 in.
Any structural concrete approved for placement by pumping	None	6 in.

Where use of superplasticizers is approved to produce flowing concrete these slump requirements do not apply.

1.6 PROPORTIONS OF MIX

1.6.1 Mixture Proportioning, Normal Weight Concrete

Concrete mix designs shall be based on the requirements of ACI 318. If the required facility strength records are not available trial batches shall contain materials proposed to be used in the project. Trial mixtures having proportions, consistencies and air content suitable for the work shall be made based on methodology described in ACI 318. Trial mixtures shall be designed for maximum permitted slump and air content. The temperature of concrete in each trial batch shall be reported. For each mix design at least three test cylinders for each test age shall be made and cured in accordance with ASTM C192/C192M. They shall be tested at 7 and 28 days in accordance with ASTM C39.

1.6.2 Average Strength

Where a concrete production facility has test records, a standard deviation shall be established. Test records from which a standard deviation is calculated shall represent materials, quality control procedures, and conditions similar to those expected; shall represent concrete produced to meet a specified strength or strengths within 1,000 psi of that specified for proposed work; and shall consist of at least 30 consecutive tests. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days or at other test age designated for determination of the specified strength.

When a concrete production facility does not have field strength test records for calculation of standard deviation or the number of tests is less than 15, the required average strength shall be:

- a. The specified strength plus 1,200 psi for specified strengths of 3,000 to 5,000 psi.

1.7 STORAGE OF MATERIALS

Cement and pozzolan shall be stored in weather-tight buildings, bins, or silos that will exclude moisture and contaminants. Aggregate stockpiles shall be arranged and used in a manner to avoid excessive segregation and to prevent contamination with other materials or with other sizes of aggregates. Reinforcing bars and accessories shall be stored above the ground on platforms, skids or other supports. Other materials shall be stored in such a manner as to avoid contamination and deterioration. Admixtures which have been in storage at the project site for longer than 6 months or which have been subjected to freezing shall not be used unless retested and proven to meet the specified requirements.

2.0 PRODUCTS

2.1 ADMIXTURES

Admixtures shall conform to the following:

2.1.1 Accelerating Admixture

ASTM C494/C494M, Type C.

2.1.2 Air-Entraining Admixture

ASTM C260.

2.1.3 High Range Water Reducer Admixture (Superplasticizers)

ASTM C1017, Type 1 or 2.

2.1.4 Water-Reducing or Retarding Admixture

ASTM C494/C494M, Type A, B, D, F, or G.

2.2 CEMENTITIOUS MATERIALS

Cementitious materials shall each be of one type and from one source when used in concrete which will have surfaces exposed in the finished structure. Cementitious materials shall conform to one of the following:

2.2.1 Cement: ASTM C150/C150M, Type I or II.

2.2.2 Portland-Pozzolan Cement: ASTM C595/C595M, Type IP.

2.2.3 Fly Ash: ASTM C618, Class F.

Pozzolan may be blended with Type I or II portland cement. When a pozzolan is used in a flexural strength concrete mix design, the solid volume of pozzolan when combined with Portland cement shall not exceed 25 percent of the weight of cementitious materials. Only one class of pozzolan, from a single source, shall be used.

2.2.4 Ground Granulated Blast Furnace Slag (GGBFS):

ASTM C989 Grade 100 or 120. GGBFS shall not exceed 50 percent of the total weight of cementitious materials.

2.3 AGGREGATES

Aggregates shall conform to the following:

2.3.1 Normal Weight Aggregate

ASTM C33. Grading requirement for coarse aggregate shall conform to size number 57. Aggregate for Portland cement concrete shall comply with the WSDOT specifications for Aggregates for Portland cement concrete.

2.4 CURING MATERIALS

2.4.1 Burlap

FS CCC-C-467.

2.4.2 Impervious Sheets

ASTM C171, type optional, except that polyethylene film, if used, shall be white opaque.

2.4.3 Membrane-Forming Compounds

ASTM C309, Type 1-D, Class A or B.

2.5 EMBEDDED ITEMS

Embedded items shall be of the size and type indicated on drawings or as needed for the application. Inserts for shelf angles and bolt hangers shall be of malleable iron or cast or wrought steel.

2.6 NONSHRINK GROUT

Nonshrink grout shall conform to ASTM C1107/C1107M Grade C and shall be a formulation suitable for the application.

2.7 WATER

Water shall be potable, except that nonpotable water may be used if it produces mortar cubes having 7- and 28-day strengths at least 90 percent of the strength of similar specimens made with water from a municipal supply. The strength comparison shall be made on mortars, identical except for mixing water, prepared and tested in accordance with ASTM C109. Water for curing shall not contain any substance injurious to concrete, or which causes staining.

2.8 CONCRETE REINFORCEMENT

2.8.1 Reinforcing Steel

Reinforcing steel shall be deformed bars conforming to ASTM A615 grade 60 with sizes as indicated.

2.8.2 Wire Ties

Wire ties shall be 16 gauge or heavier black annealed steel wire.

2.8.3 Supports

Bar supports for formed surfaces shall be designed and fabricated in accordance with CRSI MSP-1 and shall be steel or precast concrete blocks. Precast concrete blocks shall have wire ties and shall be not less than 3 by 3 inches square when supporting reinforcement on ground. Precast concrete block shall have compressive strength equal to that of the surrounding concrete. Where concrete formed surfaces will be exposed to weather or where surfaces are to be painted, steel supports within 1/2 inches of concrete surface shall be galvanized, plastic protected or of stainless steel. Concrete supports used in concrete exposed to view shall have the same color and texture as the finish surface. For slabs on grade, supports shall be precast concrete blocks;

plastic coated steel fabricated with bearing plates, or specifically designed wire-fabric supports fabricated of plastic

2.9 FORM MATERIALS

2.9.1 Forms For Class A and Class B Finish

Forms for Class A and Class B finished surfaces shall be plywood panels conforming to DOC PS 1, Grade B-B concrete form panels, Class I or II. Other form materials or liners may be used provided the smoothness and appearance of concrete produced will be equivalent to that produced by the plywood concrete form panels. Forms for round columns shall be the prefabricated seamless type.

2.9.2 Forms For Class C Finish

Forms for Class C finished surfaces shall be shiplap lumber; plywood conforming to DOC PS 1, Grade B-B concrete form panels, Class I or II; tempered concrete form hardboard conforming to AHA A135.4; other approved concrete form material; or steel, except that steel lining on wood sheathing shall not be used.

2.9.3 Form Ties

Form ties shall be factory-fabricated metal ties, shall be of the removable or internal disconnecting or snap-off type, and shall be of a design that will not permit form deflection and will not spall concrete upon removal. Solid backing shall be provided for each tie. Except where removable tie rods are used, ties shall not leave holes in the concrete surface less than 1/4 inch nor more than 1 inch deep and not more than 1 inch in diameter. Removable tie rods shall be not more than 1-1/2 inches in diameter.

2.9.4 Form Releasing Agents

Form releasing agents shall be commercial formulations that will not bond with, stain or adversely affect concrete surfaces. Agents shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds.

3.0 EXECUTION

3.1 PREPARATION OF SURFACES

Surfaces to receive concrete shall be clean and free from frost, ice, mud, and water. Conduit and other similar items shall be in place and clean of any deleterious substance.

3.1.1 Foundations

Earthwork shall be as specified in the Technical Specification 0600X-SP-C0075 for Site Work. Flowing water shall be diverted without washing over freshly deposited concrete. Semiporous subgrades for foundations and footings shall be damp when concrete is placed. Pervious subgrades shall be sealed by blending impervious material with the top 6 inches of the in-place pervious material or by covering with an impervious membrane.

3.1.2 Preparation of Previously Placed Concrete

Concrete surfaces to which other concrete is to be bonded shall be roughened in an approved manner that will expose sound aggregate uniformly without damaging the concrete. Laitance and loose particles shall be removed. Surfaces shall be moist but without free water when concrete is placed.

3.2 INSTALLATION OF EMBEDDED ITEMS

Embedded items shall be free from oil, loose scale or rust, and paint. Embedded items shall be installed at the locations indicated on drawings and required to serve the intended purpose. Voids in sleeves, slots and inserts shall be filled with readily removable material to prevent the entry of concrete.

3.3 BATCHING, MIXING AND TRANSPORTING CONCRETE

Ready-mixed concrete shall be batched, mixed and transported in accordance with ASTM C94, except as otherwise specified. Truck mixers, agitators, and non-agitating units shall comply with NRMCA. Ready-mix plant equipment and facilities shall be certified in accordance with NRMCA or WSDOT.

3.3.1 Admixtures

Admixtures shall be batched within an accuracy of 3 percent. Where two or more admixtures are used in the same batch, they shall be batched separately and must be compatible. Retarding admixture shall be added within one minute after addition of water is complete or in the first quarter of the required mixing time, whichever is first. Superplasticizing admixtures shall be added as recommended by manufacturer. Concrete that shows evidence of total collapse or segregation caused by the use of admixture shall be removed from the site.

3.3.2 Control of Mixing Water

No water from the truck system or elsewhere shall be added after the initial introduction of mixing water for the batch except when on arrival at the jobsite, and the slump of the concrete is less than that specified. Water added to bring the slump within the specified range shall not change the total water in the concrete to a point that the approved water-cement ratio is exceeded. The drum shall be turned an additional 30 revolutions, or more, if necessary, until the

added water is uniformly mixed into the concrete. Water shall not be added to the batch at any later time.

3.4 SAMPLING AND TESTING

Sampling and Testing is the responsibility of the SUBCONTRACTOR and shall be performed by an approved testing agency.

3.4.1 Aggregates

Aggregates for normal weight concrete shall be sampled and tested in accordance with ASTM C33. Gradation tests shall be performed on the first day and every other day thereafter during concrete construction.

3.4.2 Sampling of Concrete

Samples of concrete for air, slump, unit weight, and strength tests shall be taken in accordance with ASTM C172.

3.4.2.1 Air Content. Test for air content shall be performed in accordance with ASTM C173/C173M or ASTM C231. A minimum of 1 test per day shall be conducted and one for each set of compressive strength specimen.

3.4.2.2 Slump. At least 1 slump tests shall be made on randomly selected batches of each mixture of concrete during each day's concrete placement and one slump test shall be performed for each set of compressive strength specimen cast. Tests shall be performed in accordance with ASTM C143/C143M.

3.4.3 Evaluation and Acceptance of Concrete

3.4.3.1 Frequency of Testing. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 100 cubic yards of concrete, nor less than once for each 450 square feet of surface area for slabs or walls. If this sampling frequency results in less than 5 strength tests for a given class of concrete, tests shall be made from at least 5 randomly selected trucks or from each truck if fewer than 5 truck loads are used. Field cured specimens for determining form removal time or when a structure may be put in service shall be made in numbers directed to check the adequacy of curing and protection of concrete in the structure. The specimens shall be removed from the molds at the age of 24 hours and shall be cured and protected, insofar as practicable, in the same manner as that given to the portion of the structure the samples represent.

3.4.3.2 Testing Procedures. Cylinders for acceptance tests shall be molded and cured in accordance with ASTM C31. Cylinders shall be tested in accordance with ASTM C39. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days or at another specified test age.

3.4.3.3 Evaluation of Results. Concrete specified on the basis of compressive strength will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the specified strength and no individual strength test result falls below the required strength by more than 500 pounds per square inch.

3.4.4 Investigation of Low-Strength Test Results

When any strength test of standard-cured test cylinder falls below the specified strength requirement by more than 500 pounds per square inch, or if tests of field-cured cylinders indicate deficiencies in protection and curing, steps shall be taken to assure that load-carrying capacity of the structure is not jeopardized. Nondestructive testing in accordance with ASTM C597, ASTM C803/C803M or ASTM C805/C805M may be permitted by the CONTRACTOR to determine the relative strengths at various locations in the structure as an aid in evaluating concrete strength in place or for selecting areas to be cored. Such tests, unless properly calibrated and correlated with other test data, shall not be used as a basis for acceptance or rejection. When strength of concrete in place is considered potentially deficient, cores shall be obtained and tested in accordance with ASTM C42. At least three representative cores shall be taken from each member or area of concrete in place that is considered potentially deficient. The location of cores shall be determined by the CONTRACTOR to least impair the strength of the structure. If the concrete in the structure will be dry under service conditions, the cores shall be air dried (temperature 60 to 80 degrees F, relative humidity less than 60 percent) for seven days before testing and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be tested after moisture conditioning in accordance with ASTM C42. Concrete in the area represented by the core testing will be considered adequate if the average strength of the cores is equal to or at least 85 percent of the specified strength requirement and if no single core is less than 75 percent of the specified strength requirement. If the core tests are inconclusive or impractical to obtain, or if structural analysis does not confirm the safety of the structure, load tests may be directed by the CONTRACTOR in accordance with the requirements of ACI 318. Concrete work evaluated by structural analysis or by results of a load test and found deficient shall be corrected in a manner satisfactory to the CONTRACTOR. All investigations, testing, load tests, and correction of deficiencies shall be performed, and approved by the CONTRACTOR, at the expense of the SUBCONTRACTOR.

3.5 CONVEYING CONCRETE

Concrete shall be conveyed from mixer to forms as rapidly as possible and within the time interval specified in paragraph CONCRETE PLACEMENT by methods which will prevent segregation or loss of ingredients.

3.5.1 Chutes

When concrete can be placed directly from a truck mixer or other transporting equipment, chutes attached to this equipment may be used. Separate chutes will not be permitted except when specifically approved.

3.5.2 Buckets

Bucket design shall be such that concrete of the required slump can be readily discharged. Bucket gates shall be essentially grout tight when closed. The bucket shall provide means for positive regulations of the amount and rate of deposit of concrete in each dumping position.

3.5.3 Belt Conveyors

Belt conveyors may be used when approved. Belt conveyors shall be designed for conveying concrete and shall be operated to assure a uniform flow of concrete to the final place of deposit without segregation or loss of mortar. Conveyors shall be provided with positive means for preventing segregation of the concrete at transfer points and point of placement.

3.5.4 Pumps

Concrete may be conveyed by positive displacement pumps when approved. Pump shall be the piston or squeeze pressure type. Pipeline shall be steel pipe or heavy-duty flexible hose. Inside diameter of the pipe shall be at least three times the maximum size of the coarse aggregate. Distance to be pumped shall not exceed the limits recommended by the pump manufacturer. Concrete shall be supplied to the pump continuously. When pumping is completed, the concrete remaining in the pipeline shall be ejected without contaminating the concrete in place. After each use, the equipment shall be thoroughly cleaned. Flushing water shall be wasted outside the forms.

3.6 CONCRETE PLACEMENT

Mixed concrete which is transported in truck mixers or agitators or concrete which is truck mixed, shall be discharged within 1-1/2 hours or before the drum has revolved 300 revolutions, whichever comes first after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates. These limitations may be waived by the CONTRACTOR if the concrete is of such slump after the 1-1/2 hour time or 300-revolution limit has been reached that it can be placed, without the addition of water to the batch. When the concrete temperature exceeds 85 degrees F, the time shall be reduced to 45 minutes. Concrete in excess of 90 degrees F shall not be placed under any circumstances. Concrete shall be placed within 15 minutes after it has been discharged from the truck.

3.6.1 Placing Operation

Concrete shall be handled from mixer to forms in a continuous manner until the approved unit of operation is completed. Adequate scaffolding, ramps and walkways shall be provided so that personnel and equipment are not supported by in-place reinforcement. Placing will not be permitted when the sun, heat, wind, or limitations of facilities furnished by the SUBCONTRACTOR prevent proper consolidation, finishing and curing. Concrete shall be deposited as close as possible to its final position in the forms, and there shall be no vertical drop

greater than 8 feet except where suitable equipment is provided to prevent segregation and where specifically authorized. Depositing of the concrete shall be so regulated that it will be effectively consolidated in horizontal layers not more than 12 inches thick), except that slabs shall be placed in a single layer. Concrete to receive other construction shall be screeded to the proper level to avoid excessive shimming or grouting.

3.6.2 Consolidation

Immediately after placing, each layer of concrete shall be consolidated by internal vibrators, except for slabs 4 inches thick or less. The vibrators shall be adequate in effectiveness and number to properly consolidate the concrete: a spare vibrator shall be kept at the jobsite during concrete placing operations. The vibrators shall have a frequency of not less than 8000 vibrations per minute, and the head diameter and amplitude shall be appropriate for the concrete mixture being placed. Vibrators shall be inserted vertically at uniform spacing over the area of placement. The distance between insertions shall be approximately 1-1/2 times the radius of action of the vibrator so that the area being vibrated will overlap the adjacent just-vibrated area by a few inches. The vibrator shall penetrate rapidly to the bottom of the layer and at least 6 inches into the preceding layer if there is such.

Vibrator shall be held stationary until the concrete is consolidated and then withdrawn slowly. The use of form vibrators must be specifically approved. Vibrators shall not be used to transport concrete within the forms. Slabs 4 inches and less in thickness shall be consolidated by properly designed vibrating screeds or other approved technique.

3.6.3 Cold Weather Requirements

Special protection measures in accordance with ACI 306R, approved by the CONTRACTOR, shall be used if the three day average of average daily temperature is less than 40 degrees F. The ambient temperature of the air where concrete is to be placed and the temperature of surfaces to receive concrete shall be not less than 40 degrees F. The temperature of the concrete when placed shall be not less than 50 degrees F or more than 75 degrees F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperature. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals or other materials shall not be incorporated in the concrete to prevent freezing. Upon written approval, chemical admixture conforming to ASTM C494/C494M Type C or E may be used. Calcium chloride shall not be used in concrete in any circumstance.

3.6.4 Hot Weather Requirements

The temperature of the concrete placed during warm weather shall not exceed 85 degrees F except where a CONTRACTOR approved retarder is used. The mixing water and aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. In no case shall the placing temperature exceed 90 degrees F. Other placement operations shall be in accordance with ACI 305R.

3.7 CONSTRUCTION JOINTS

Construction joints shall be located as indicated on drawings or approved. Where weather, end of work shift or other similar type of delay interrupts concrete work, location and type of construction joint shall be subject to approval of the CONTRACTOR. Unless otherwise indicated and except for slabs on grade, reinforcing steel shall extend through construction joints. Construction joints in slabs on grade shall be keyed or doweled as shown.

3.8 FINISHING CONCRETE

3.8.1 Formed Surfaces

Repair of Surface Defects. Surface defects shall be repaired within 24 hours after the removal of forms. Honeycombed and other defective areas shall be cut back to solid concrete or to a depth of not less than 1 inch, whichever is greater. Edges shall be cut perpendicular to the surface of the concrete. The prepared areas shall be dampened and brush-coated with neat cement grout. The repair shall be made using mortar consisting of not more than 1 part cement to 2-1/2 parts sand. The mixed mortar shall be allowed to stand to stiffen (approximately 45 minutes), during which time the mortar shall be intermittently remixed without the addition of water. After the mortar has attained the stiffest consistency that will permit placing, the patching mix shall be thoroughly tamped into place by means approved by the CONTRACTOR and finished slightly higher than the surrounding surface. For Class A and Class B finished surfaces, the cement used in the patching mortar shall be a blend of job cement and white cement proportioned to produce a finished repair surface matching, after curing, the color of adjacent surfaces. Holes left after the removal of form ties shall be cleaned and filled with patching mortar. Holes left by the removal of tie rods shall be reamed and filled by dry-packing. Repaired surfaces shall be cured as required for adjacent surfaces. The temperature of concrete, mortar patching material and ambient air shall be above 50 degrees F while making repairs and during the curing period. Concrete with defects that affect the strength of the member or with excessive honeycombs will be rejected, or the defects shall be corrected as directed.

3.8.1.1 Class A Finish. Where a Class A finish is indicated, fins shall be removed. A mortar mix consisting of one part portland cement and two parts well-graded sand passing a No. 30 sieve, with water added to give the consistency of thick paint, shall be prepared. White cement shall be used to replace part of the job cement. After the surface has been thoroughly wetted and allowed to approach surface dryness, the mortar shall be vigorously applied to the area by clean burlap pads or by cork or wood-floating, to completely fill surface voids. Excess grout shall be scraped off with a trowel. As soon as it can be accomplished without pulling the mortar from the voids, the area shall be rubbed with burlap pads until all visible grout film is removed. The rubbing pads shall have on their surfaces the same sand-cement mix specified above but without any mixing water. The finish of any area shall be completed in the same day, and the limits of a finished area shall be made at natural breaks in the surface. The surface shall be continuously moist cured for 48 hours. The temperature of the air adjacent to the surface shall be not less than 50 degrees F for 24 hours prior to, and 46 hours after, the application. In hot, dry weather the smooth finish shall be applied in shaded areas.

3.8.1.2 Class B Finish. Where a Class B finish is indicated, fins shall be removed. Concrete surface shall be smooth with a texture at least equal to that obtained through the use of Grade B-B plywood forms.

3.8.1.3 Class C Finish. Where a Class C finish is indicated, fins shall be removed. Concrete surfaces shall be relatively smooth with a texture imparted by the forms used.

3.8.2 Unformed Surfaces

In cold weather, the air temperature in areas where concrete is being finished shall not be less than 50 degrees F. In hot windy weather when the rate of evaporation of surface moisture, as determined by methodology presented in ACI 305R, may reasonably be expected to exceed 0.2 pounds per square foot per hour; coverings, windbreaks, or fog sprays shall be provided as necessary to prevent premature setting and drying of the surface. The dusting of surfaces with dry materials or the addition of water during finishing will not be permitted. Finished surfaces shall be plane, with no deviation greater than 5/16 inches when tested with a 10-foot straightedge. Floor tolerance measurements shall be made as soon as possible after finishing. When forms or shoring are used the measurements shall be made prior to their removal. Surfaces shall be pitched to drains.

3.8.2.1 Float Finish. Slabs to receive a steel trowel finish and slabs to be given a float finish shall be indicated. Screeding shall be followed immediately by darbying or bull floating before bleeding water is present, to bring the surface to a true, even plane. After the concrete has stiffened to permit the operation and the water sheen has disappeared, it shall be wood floated. Lightweight concrete or concrete that portrays stickiness shall be finished with a magnesium float in lieu of a wood float, and left free of ridges and other projections. Care shall be exercised not to increase the bleed water while finishing the loading/unloading slab.

3.8.2.2 Light Broomed Finish. Float finish as noted above. After surface moisture has disappeared, hand trowel concrete to produce smooth, impervious surface, free from trowel marks. Then draw fine-hair broom lightly across surface. Broom in same direction and parallel to expansion joints or in the case of inclined slabs, perpendicular to the slope.

3.8.2.3 Finish Schedule

<u>Concrete Surface</u>	<u>Finish Type</u>
Vertical Exterior Exposed	Class A
Vertical Unexposed	Class C
Vertical Interior Exposed	Class B
Crest Pad Building Slab	Float

3.9 CURING AND PROTECTION

3.9.1 General

Concrete shall be cured by an approved method for the period of time given below:

Concrete with Type III cement	3 days
Concrete with Type I, II, IP or IS cement	7 days
Concrete with Type I or Type II cement blended with pozzolan	7 days

Immediately after placement, concrete shall be protected from premature drying extremes in temperatures, rapid temperature change, mechanical injury and injury from rain and flowing water. Air and forms in contact with concrete shall be maintained at a temperature above 50 degrees F for the first 3 days and at a temperature above 32 degrees F for the remainder of the specified curing period. Exhaust fumes from combustion heating units shall be vented to the outside of the enclosure and heaters and ducts shall be placed and directed so as not to cause areas of overheating and drying of concrete surfaces or to create fire hazards. All materials and equipment needed for adequate curing and protection shall be available and at the site prior to placing concrete. No fire or excessive heat shall be permitted near or in direct contact with the concrete at any time. Curing shall be accomplished by any of the following methods, or combination thereof, as approved.

3.9.2 Moist Curing

Concrete to be moist-cured shall be maintained continuously wet for the entire curing period. If water or curing materials used stains or discolors concrete surfaces that are to be permanently exposed, the concrete surfaces shall be cleaned. When wooden forms are left in place during curing, they shall be kept wet at all times. If the forms are removed before the end of the curing period, curing shall be carried out as on unformed surfaces, using suitable materials. Horizontal surfaces shall be cured by pending, by covering with a 2-inch minimum thickness of continuously saturated sand, or by covering with waterproof paper, polyethylene sheet, polyethylene-coated burlap or saturated burlap.

3.9.3 Membrane Curing

Membrane curing shall not be used on surfaces that are to receive any subsequent treatment depending on adhesion or bonding to the concrete.. The curing compound selected shall be compatible with any subsequent paint, roofing, waterproofing or flooring specified. Membrane curing compound shall not be used on surfaces that are maintained at curing temperatures with free steam. Curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. Surfaces shall be thoroughly moistened with water and the curing compound shall be applied to slab surfaces as soon as the bleeding water has disappeared, with the tops of joints being temporarily sealed to prevent entry of the compound and to prevent moisture loss during the curing period. Compound shall be applied in a one-coat

continuous operation by mechanical spraying equipment, at a uniform coverage in accordance with the manufacturer's printed instructions. Concrete surfaces that have been subjected to rainfall within 3 hours after curing compound has been applied shall be re-sprayed by the method and at the coverage specified. On surfaces permanently exposed to view, the surface shall be shaded from direct rays of the sun for the duration of the curing period. Surfaces coated with curing compound shall be kept free of foot and vehicular traffic, and from other sources of abrasion and contamination during the curing period.

3.10 SETTING BASE PLATES AND BEARING PLATES

After being properly positioned, column base plates, bearing plates for beams and similar structural members, and machinery and equipment base plates shall be set to the proper line and elevation with damp-pack bedding mortar, except where nonshrink grout is indicated. The thickness of the mortar or grout shall be approximately 1/24 the width of the plate, but not less than 3/4 inches. Concrete and metal surfaces in contact with grout shall be clean and free of oil and grease, and concrete surfaces in contact with grout shall be damp and free of laitance when grout is placed.

3.10.1 Damp-Pack Bedding Mortar

Damp-pack bedding mortar shall consist of 1 part cement and 2-1/2 parts fine aggregate having water content such that a mass of mortar tightly squeezed in the hand will retain its shape but will crumble when disturbed. The space between the top of the concrete and bottom of the bearing plate or base shall be packed with the bedding mortar by tamping or ramming with a bar or rod until it is completely filled.

3.10.2 Nonshrink Grout

Nonshrink grout shall be mixed and placed in accordance with material manufacturer's written recommendations. Forms of wood or other suitable material shall be used to retain the grout. The grout shall be placed quickly and continuously, completely filling the space without segregation or bleeding of the mix.

3.10.3 Treatment of Exposed Surfaces

For mortars or grouts, exposed surfaces shall be left untreated. Curing shall comply with Section 3.9, CURING AND PROTECTION.

3.11 REINFORCEMENT

Reinforcement shall be fabricated to shapes and dimensions shown and shall conform to the requirements of ACI 318/318R. Reinforcement shall be cold bent unless otherwise authorized. Bending may be accomplished in the field or at the mill. Bars shall not be bent after embedment in concrete. Safety caps shall be placed on exposed ends of vertical concrete reinforcement bars in accordance with OSHA requirements. Wire tie ends shall face away from the forms.

3.11.1 Placement

Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete. Reinforcement shall be placed in accordance with ACI 318/318R at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated or as required by ACI 318/318R. If bars are moved more than 2 inches to avoid interference with other reinforcement, conduits, or embedded items, additional reinforcement shall be added.

3.11.2 Splicing

Splices of reinforcement shall conform to ACI 318/318R and shall be made only as required or indicated. Splicing shall be by lapping or by mechanical or welded butt connection; except that lap splices shall not be used for bars larger than No. 11 unless otherwise indicated. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one-fifth the required length of lap or 6 inches. Mechanical butt splices shall be in accordance with the recommendation of the manufacturer of the mechanical splicing device. Butt splices shall develop 125 percent of the specified minimum yield tensile strength of the spliced bars or of the smaller bar in transition splices. Bars shall be flame dried before butt splicing. Adequate jigs and clamps or other devices shall be provided to support, align, and hold the longitudinal centerline of the bars to be butt spliced in a straight line.

3.12 CONCRETE FORMWORK

Formwork shall be designed in accordance with methodology of ACI 347R for anticipated loads, lateral pressures, and stresses. Forms shall be capable of producing a surface that meets the requirements of the class of finish specified in Table 1. Forms shall be capable of withstanding the pressures resulting from placement and vibration of concrete.

3.12.1 Storage and Handling

Fiber voids shall be stored above ground level in a dry location. Fiber voids shall be kept dry until installed and overlaid with concrete.

3.12.2 Formwork

Forms shall be mortar tight, properly aligned and adequately supported to produce concrete surfaces meeting the surface requirements specified herein and conforming to construction tolerance given in TABLE 1. Where concrete surfaces are to have a Class A or Class B finish, joints in form panels shall be arranged as approved. Where forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface so as to obtain accurate alignment of the surface and to prevent leakage of mortar. Forms shall not be

reused if there is any evidence of surface wear and tear or defects that would impair the quality of the surface. Surfaces of forms to be reused shall be cleaned of mortar from previous concreting and of other foreign material before reuse. Form ties that are to be completely withdrawn shall be coated with a nonstaining bond breaker.

3.12.3 Chamfering

Except as otherwise shown, external corners that will be exposed shall be chamfered, beveled, or rounded by moldings placed in the forms.

3.12.4 Coating

Forms for Class A and Class B finished surfaces shall be coated with a form-releasing agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's printed or written instructions. Forms for Class C and D finished surfaces may be wet with water in lieu of coating immediately before placing concrete, except that in cold weather, with probable freezing temperatures, coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

3.12.5 Removal of Forms

Forms shall be removed in a manner that will prevent injury to the concrete and ensure the complete safety of the structure. Formwork for columns, walls, side of beams and other parts not supporting the weight of concrete may be removed when the concrete has attained sufficient strength to resist damage from the removal operation but not before at least 24 hours has elapsed since concrete placement. Supporting forms and shores shall not be removed from beams, floors and walls until the structural units are strong enough to carry their own weight and any other construction or natural loads. In no case will supporting forms or shores be removed before the concrete strength has reached 70 percent of design strengths as determined by field cured cylinders or other approved methods. This strength shall be demonstrated by job-cured test specimens, and by a structural analysis considering the proposed loads in relation to these test strengths and the strength of forming and shoring system. The job-cured test specimens for form removal purposes shall be provided in numbers as directed and shall be in addition to those required for concrete quality control. The specimens shall be removed from molds at the age of 24 hours and shall receive, insofar as possible, the same curing and protection as the structures they represent.

**TABLE 1
TOLERANCES FOR FORMED SURFACES**

1.	Variations from the plumb:		
	a. In the lines and surfaces of columns piers, walls and in arises	In any 10 feet of length Maximum for entire length	1/4 inch 1 inch
	b. For exposed corner columns, control-joint grooves, and other conspicuous lines	In any 20 feet of length Maximum for entire length	1/4 inch 1/2 inch
2.	Variation of the linear building lines from established position in plan	In any 20 feet Maximum	1/2 inch 1 inch
3.	Variation of distance between walls, columns, partitions	1/4 inch per 10 feet of distance, but not more than 1/2 inch in any one bay, and not more than 1 inch total variation	
4.	Variation in the sizes and locations of sleeves, floor openings, and wall opening	Minus Plus	1/4 inch 1/2 inch
5.	Variation in cross-sectional dimensions of columns and beams and in the thickness of slabs and walls	Minus Plus	1/4 inch 1/2 inch
6.	Footings:		
	a. Variation of dimensions in plan	Minus Plus when formed or plus 3 inches when placed against unformed excavation	1/2 inch 2 inch
	b. Misplacement of eccentricity	2 percent of the footing width in the direction of misplacement, but not more than 2 inches	2 inches
	c. Reduction in Thickness	Minus	5 percent of specified thickness

3.13 CONSTRUCTION QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall submit to CONTRACTOR records of his quality control for operations including but not limited to the following:

- (1) Concrete Cylinder Strength Tests.

- (2) Test For Concrete Air Entrainment.
- (3) Concrete Slump Tests.
- (4) Check delivered material against approved shop drawings.
- (5) Inspection of location and spacing of bars.
- (6) Inspection of forms for adequate bracing.
- (7) Check form dimensions, and elevations for conformance to Subcontract documents.
- (8) Periodic inspection of condition of forms.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be furnished to the CONTRACTOR within 1 working day of the inspection or test.

CREST PAD BUILDING

CONTENTS

1.0	GENERAL.....	3
	1.1 SUMMARY.....	3
	1.2 ABBREVIATIONS.....	3
	1.3 CODES, STANDARDS, LAWS, AND REGULATIONS.....	3
	1.4 SYSTEM DESCRIPTION.....	6
	1.5 DESIGN REQUIREMENTS.....	7
	1.6 TECHNICAL SUBMITTALS.....	8
	1.7 QUALITY ASSURANCE.....	10
	1.8 DELIVERY, STORAGE, AND HANDLING.....	10
	1.9 SPECIAL GUARANTEE.....	10
2.0	MATERIALS AND EQUIPMENT.....	11
	2.1 BUILDING SYSTEM MANUFACTURERS.....	11
	2.2 COMPONENTS.....	12
	2.3 ACCESSORIES.....	13
	2.4 FABRICATION.....	17
3.0	EXECUTION.....	18
	3.1 EXAMINATION.....	18
	3.2 BUILDING ERECTION.....	18
	3.3 INSTALLATION OF SEALANTS AND CAULKING.....	19
	3.4 INSTALLATION OF PLYWOOD.....	20
	3.5 HARDWARE INSTALLATION AND PROTECTION.....	20
	3.6 HARDWARE SETS.....	20
	3.7 REPAIR, CLEANING, AND PAINTING.....	21
	3.8 CONSTRUCTION QUALITY CONTROL.....	21
	3.9 MANUFACTURER'S SERVICES.....	22

CREST PAD BUILDING

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for the Crest Pad Building.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

AAMA	American Architectural Manufacturers' Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
DOC	Department of Commerce
IBC	International Building Code
ICBO	International Conference of Building Officials
MBMA	Metal Building Manufacturer's Association
MSDS	Material Data Safety Sheet
NFOPA	National Forest Products Association
NFPA	National Fire Protection Association
PS	U.S. Department of Commerce-Product Standards
QAP	Quality Assurance Program
SDI	Steel Door Institute
SSRS	Subcontractor/Supplier Submittal Requirements Summary
UL	Underwriters Laboratories, Inc.

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for the Crest Pad Building. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to the Crest Pad Building. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

AAMA 606.1	Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum
AAMA 2605	Voluntary Specification Performing Requirements and Test Procedures for Superior Organic Coatings on Aluminum Extrusions and Panels
AISC	Quality Certification Program
AISC 360	Specification for Structural Steel Buildings
AISC D803	Steel Design Guide Series 3 - Serviceability Design Considerations for Low-Rise Buildings
AISC S329	Allowable Stress Design Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts
AISC S348	LRFD Specification for Structural Joints Using ASTM A325 or A490 Bolts
ANSI A156.1	Butts and Hinges (BHMA 101)
ANSI A156.2	Bored and Preassembled Locks & Latches (BHMA 601)
ANSI A156.4	Door Controls - Closers (BHMA 301)
ANSI A156.13	Mortise Locks & Latches (BHMA 621)
ANSI A156.18	Materials and Finishes (BHMA 1301)
AISI SG-671/2	Specification for the Design of Cold-Formed Steel Structural Members
APA	APA: Grades and Specifications
ASTM A36/A36M	Standard Specification for Carbon Structural Steel
ASTM A307	Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A325	Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A490	Standard Specification for Structural Bolts, Alloy Steel, Heat-Treated, 150 ksi Minimum Tensile Strength

ASTM A529/A529M	Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality
ASTM A572/A572M	Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A653/A653M	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A792/A792M	Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM A992/A992M	Standard Specification for Structural Steel Shapes
ASTM C920	Standard Specification for Elastomeric Joint Sealants
ASTM C991	Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings
ASTM C1048	Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass
ASTM C1193	Standard Guide for Use of Joint Sealants
ASTM D2898	Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM E96/E96M	Standard Test Methods for Water Vapor Transmission of Materials
ASTM E1514	Standard Specification for Structural Standing Seam Steel Roof Panel Systems
ASTM F1554	Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
AWPA C2	Lumber, Timbers, Bridge Ties and Mine Ties Preservative Treatment by Pressure Processes
AWPA C20	Structural Lumber - Fire-Retardant Treatment by Pressure Processes
AWPA C27	Plywood – Fire-Retardant Treatment by Pressure Processes

AWS D1.1/D1.1M	Structural Welding Code - Steel
AWS D1.3/D1.3M	Structural Welding Code - Sheet Steel
DOE-STD-1066-99	Fire Protection Design Criteria
IBC	International Building Code (IBC)
MBMA	Low Rise Building Systems Manual
NFPA 101	Life Safety Code (for egress, stairs, handrails, etc.)
NFPA 255	Standard Method of Test for Surface Burning Characteristics of Building Materials
PRP-108	Performance Standards and Policies for Structural-Use Panels
PS	PS1, Construction and Industrial Plywood. SDI 100 Recommended Specifications, Standard Steel Doors and Frames
SDI 100	Recommended Specifications, Standard Steel Doors and Frames
UL 580	Tests for Uplift Resistance of Roof Assemblies
UL 723	Standard for Test for Surface Burning Characteristics of Building Materials

1.4 SYSTEM DESCRIPTION

- A. Complete building package using manufacturer's standard components/accessories and components/accessories as specified and noted on the Drawings.
- B. Primary Framing System: Clear span rigid frame
- C. Lateral Support System in Longitudinal Direction: Cross bracing, located as shown on Drawings
- D. Include: Doors, hardware, glazing, louvers, insulation and all sub-framing for door and louver openings.
- E. SUBCONTRACTOR shall provide and facilitate installation of items not provided by metal building manufacturer including, but not limited to, metal studs, tracks and

accessories specified in the Technical Specifications for Metals and Wood products specified herein.

1.5 DESIGN REQUIREMENTS

- A. Applicable Building Code: The 2009 International Building Code (IBC) as amended by the State of Washington and local agencies.
- B. Snow Load:
1. Ground Snow Load (P_g): 15 pounds per square foot.
 2. Flat Roof Snow Load, (P_f): 20.0 pounds per square foot
 3. Exposure Coefficient (C_e): 0.9
 4. Snow Load Importance Factor (I): 1.10
 5. Thermal Factor, (C_t): 1.10
- C. Minimum Roof Live Load: 20 pounds per square foot.
- D. Building system dead load.
- E. Mechanical and Electrical Equipment Loads:
1. Purlins and Secondary Framing: As indicated on Drawings, minimum 10 pounds per square foot.
 2. Primary Frames: As indicated on Drawings, minimum 5 pounds per square foot.
- F. Wind Load:
1. Basic Wind Speed: 85 miles per hour.
 2. Exposure Category: C
 3. Wind Load Importance Factor (I): 1.15
 4. Internal Pressure Coefficient, (GC_{pi}): ± 0.18
- G. Seismic Load:
1. Seismic Importance Factor, (I) = 1.25
 2. Occupancy Category: III.
 3. Mapped Spectral Response Accelerations, $S_S = 0.455$ $S_1 = 0.145$
 4. Site Class: D
 5. Spectral Response Coefficients: $S_{DS} = 0.44$, $S_{D1} = 0.20$
 6. Seismic Design Category: C
 7. Seismic Force Resisting System
N-S Ordinary Steel Moment Frame

Response Modification Factor, (R): =3.5
Seismic Response Coefficient, (CS): =0.161
E-W Ordinary Steel Concentrically Braced Frame
Response Modification Factor, (R): =3.25
Seismic Response Coefficient, (CS): =0.173

H. Deflection Criteria:

1. In accordance with the applicable provisions of the AISC D803 Steel Design Guide Series 3 - Serviceability Design Considerations for Low-Rise Steel Buildings.
2. Applies to primary and secondary framing members, bracing members, roof panels, and wall cladding.

I. Design Standards:

1. AISC 360 Specification for Structural Steel Buildings.
2. AISC S348 Specification for Structural Joints Using ASTM A325 or A490 Bolts.
3. AISI SG-671/2 Specification for the Design of Cold-Formed Steel Structural Members.
4. AWS D1.1/D1.1M, Structural Welding Code - Steel.

1.6 TECHNICAL SUBMITTALS

A. Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "T", Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

B. Shop Drawings:

1. Manufacturer's literature and technical data.
2. Painting System: Specifications including paint manufacturer's name, product trade-name, and preparation for shop and field coats.
3. Structural Calculations Stamped by Registered Professional Engineer:
 - a. Complete analysis and design of structural components and connections in accordance with design requirements indicated.

- b. Consider prying action of bolts for bolted moment-resistant connections in primary framing.
 - c. Design column bases as pinned, unless specifically indicated otherwise.
 - d. Mark out calculations that do not apply to specific Project.
4. Drawings Stamped by Registered Professional Engineer: Drawings shall be specifically prepared for this Project. Mark out details that do not apply to specific Project. Show design load criteria, material specifications for framing members and connections, roof framing plan with dimensions and member sizes, base plate details showing anchor bolt size and bolt layout, elevations of wall framing and bracing, instructions for temporary bracing, framing around roof and wall openings, details for joining and sealing of roof panels and wall cladding, and sections and details for all standard and non-standard components and accessories.
- C. Samples: Minimum 2-in. by 3-in. metal for components requiring color selection.
- D. Informational Submittals:
- 1. Manufacturer's written instructions for shipping, handling, storage, protection and erection, or installation of building and components.
 - 2. Manufacturer:
 - a. Certification or proof of current membership in Metal Building Manufacturer's Association (MBMA).
 - 3. Erector:
 - a. AISC Quality Certification: AISC certificate showing name and address of erector, effective date, and category of certification, or, in lieu of AISC certification, documentation of past 5 years' experience record to include project name, location, date of completion, building manufacturer, and name and phone number of OWNER's contact person.
 - b. Certification of approval by manufacturer.
 - 4. Manufacturer's Certificate of Proper Installation.

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Designer: Registered professional engineer valid in same state as Project.
2. Manufacturer:
 - a. Current member of Metal Building Manufacturer's Association (MBMA).
3. Erector:
 - a. AISC Quality Certification as Certified Steel Erector (CSE), or 5 years of experience in erection of metal building systems in lieu of AISC certification.
 - b. Approval by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect building components and accessories from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Deliver to site with parts individually tagged.
- C. Store on wood blocking or pallets, flat and off ground, to keep clean and to prevent any damage or permanent distortion. Support bundles so there is no danger of tipping, sliding, rolling, shifting, or material damage. Cover with tarpaulins or other suitable weather tight ventilated covering.
- D. Protect finish of metal panels by application of removable plastic film or other suitable material placed between panels. Do not allow panels to come in contact with other material that would result in scratching, denting, staining or other damage to the panel finish.

1.9 SPECIAL GUARANTEE

- A. Furnish manufacturer's extended guarantee or warranty, with CONTRACTOR named as beneficiary, in writing, as special guarantee. Special guarantee shall provide for correction, or at the option of CONTRACTOR, removal and replacement of Work specified in this Specification section found defective during a minimum period of 5 years and as stated below after date of Substantial Completion. Duties and obligations for correction or removal and replacement of defective Work as specified in the General Conditions.

B. Conditions:

1. Finish on metal roof and wall panels, flashing, and trim will not crack, check, blister, peel, flake, chip, or lose adhesion for 5 years.
2. Roofing will remain weather tight for 20 years.

2.0 MATERIALS AND EQUIPMENT**2.1 BUILDING SYSTEM MANUFACTURERS****A. Products manufactured or supplied by the following, and meeting these Specifications, may be used on this Project:**

1. American Buildings Company, Columbus, GA.
2. Behlen Manufacturing Co., Columbus, NE.
3. Bigbee Steel Buildings, Inc., Muscle Shoals, AL.
4. Butler Manufacturing Co., Kansas City, MO.
5. Ceco Corp., Columbus, MS.
6. Chief Industries, Inc., Grand Island, NE.
7. Garco Building Systems, Airway Heights, WA.
8. Metallic Building Co. Div., NCI Building Systems, Inc., Houston, TX.
9. Nucor Building Systems, Waterloo, IN.
10. Ruffin Building Systems, Oak Grove, LA.
11. Star Building Systems, a Robertson Ceco Co., Oklahoma City, OK.
12. Steelox Systems, Inc., Mason, OH.
13. United Structures of America, Inc., Houston, TX.
14. VP Buildings, Memphis, TN.
15. Whirlwind Building Systems, Houston, TX.

B. Building layout as shown on Drawings is based on products of Star Building Systems.

2.2 COMPONENTS

A. Structural Framing and Bracing:

1. Primary Framing: ASTM A36/A36M, A529/A529M, A572/A572M, or A992/A992M with 3/16-in. minimum thickness and factory primer compatible with finish coating.
2. Secondary Framing: Steel for cold-formed galvanized channel and z-sections shall be ASTM A653/A653M, Structural Steel (SS) Grade 33 or High-Strength Low-Alloy Steel (HSLAS) Grade 50 Type A or B, with G60 galvanized coating and minimum design thickness equal to 1 mm.
3. Bracing:
 - a. ASTM A36/A36M or F1554, Grade 36, for threaded rod, or ASTM A36/A36M for rolled shapes.
 - b. Do not use wire rope or cable for permanent bracing.
4. Bolted Connections:
 - a. Primary Framing: ASTM A325 or ASTM A490 high-strength bolted connections.
 - b. Secondary Framing: ASTM A307 or ASTM A325.

B. Roof and Wall Panels:

1. Material
 - a. ASTM A653/A653M or ASTM A792/A792M preformed ribbed steel panels, Grade 50, minimum.
 - b. Minimum 24-gauge galvanized steel with roll-formed corrugations for structural stiffness and appearance.
 - c. Finish: Polyvinylidene Fluoride : Kynar 500, two coats minimum in color shown or selected by CONTRACTOR.

2. Roof Panel System:

- a. ASTM E1514 structural standing seam steel roof panel system.
- b. Panels shall be one piece from eave to ridge, with concealed clips and fasteners to purlins to allow for thermal movement over 120-degree ambient temperature range.
- c. Side lap joints shall be made with a factory caulked, mechanically seamed cleat.
- d. Tested and certified to meet UL 580, Class 90 wind uplift rating.

3. Wall Panel System:

- a. One-piece from eave to sill, with base trim at sill.
- b. Side laps: Interlocking ribs with concealed fasteners.

4. Interior Wall and Ceiling Coverings:

- a. Exposed interior walls and ceilings (including ceilings formed by the underside of roofs), and any factory-installed facing material, should have a UL 723 (ASTM E84) (Test for Surface Burning Characteristics of Building Materials)-listed/FM-approved flame spread rating of 25 or less and a smoke developed rating of 50 or less, per DOE-STD-1066-99, Section 9.3.1.

2.3 ACCESSORIES

A. Hollow Metal Doors, Frames, and Glazing:

1. Furnish pressed steel frames and full flush hollow metal doors meeting Steel Door Institute (SDI) 100, Grade II, Model 1, 18 gauge or heavier.
 - a. See Door and Hardware Schedule on Drawings for tabulation of door and frame characteristics.
2. Glazing:
 - a. Tempered Flat Glass (kind HS and FT): ASTM C1048, clear tempered flat glass, 6 mm minimum thickness.
 - b. Ancillary materials as required.

B. Hardware Materials:

1. General:

- a. Furnish finish hardware with suitable stainless steel fasteners for complete installation.
- b. Products complete and of equal quality and finish.

2. Butt Hinges: ANSI A156.1.

Type	Item	ANSI/BHMA	Stanley	McKinney
H1	Heavy Weight, ball bearing, 5 knuckle	A5111	FBB199 (32D)	T4A3386

3. Locks and Latches: ANSI A156.2 or A156.13, key new locks into existing key system; furnish two keys for each lock and two master keys.

Type	Item	ANSI/BHMA	Schlage Planet	Sargent LB	Best 4C
L1	Entrance lock	F82	D53PD	8G05	84K7AB
L3	Latch set	F75	D10S	8U15	84K0N

4. Closers: ANSI A156.4 with painted finish.

Type	Item	ANSI/BHMA	LCN	Sargent
C4	Parallel arm with integral stop	C02021	4110 Cush-N-Stop Series	350-PS Series
C6	Parallel arm with integral stop and hold-open	C02061	4110-H Cush-N-Stop Series	350-PSH Series

5. Thresholds:

Type	Item	ANSI/BHMA	Pemco	Reese
T1	Saddle	--	175A	S104A

6. Weather-stripping:

Type	Item	ANSI/BHMA	Pemco	Reese
W1	Head and jamb Door shoe Rain drip	--	S88D 222AV 346C	797B DB596AF R201C

7. Finishes: ANSI A156.18, satin chromium-plated No. 626, unless indicated otherwise.

8. Nameplates: Beveled edge plastic plate, 3 mm thick, 5 cm high black, with 2.5 cm high white Helvetica letters.
- C. Overhead Coiling (Roll-Up) Doors: Furnish formed interlocking curtain of galvanized steel slats with manufacturer's standard insulation polyester, coating system for exterior applications: Polyester 500, two coats minimum in color shown or selected by CONTRACTOR.
1. Design to resist specified wind loads.
 2. Curtain: Coiled on pipe of sufficient size to carry door load.
 3. Counterbalance with helical springs contained in pipe.
 4. House coil in sheet metal hood with internal weather-stripping.
 5. Construct door with suitable opening and closing action, steel track, and ball bearing rollers.
 6. Furnish accessories and fasteners required for a complete installation to include inside locking device.
 7. Operation: Manually operated with endless chain.
- D. Fixed Louvers:
1. General: Drainable blade type louver with self closing damper.
 2. Material: 20-gauge galvanized steel; factory finish to match wall panels.
 3. Free Airflow: Minimum 5 percent.
 4. Weather Projection: 60 percent or more.
 5. Insect Screen: Manufacturer's standard 14 to 18 mesh.
 6. See Louver Schedule on Drawings for tabulation of louver characteristics.
- E. Metal Building Blanket Insulation:
1. ASTM C991, Type II, thickness as required to achieve a minimum R-value of 19 at exterior walls and 30 at roof.

2. 2-mil thick white vinyl vapor barrier backing with Water Vapor Permeance Rating of 0.1 maximum, ASTM E96, Procedure A.
 3. Flame Spread: ASTM E84, 25 or less (DOE-STD-1066-99, Section 9.3.1).
 4. Smoked Developed: ASTM E84, 50 or less (DOE-STD-1066-99, Section 9.3.1).
 5. Provide at roof and walls in R-value specified and as indicated on Drawings.
- F. Thermal Blocks: High-density, 2 cm thick extruded polystyrene, for installation over structural framing members.
- G. Trim: Factory-formed and factory-painted ridge cap, rake trim, simple eave trim, panel side trim, corner trim, door trim, and all other trim as necessary.
- H. Gutter Fascia and Downspouts:
1. Material: ASTM A653/A653M 26-gauge galvanized steel.
 2. Gutter Fascia:
 - a. Prefinish.
 - b. Furnish hangers with factory-applied paint.
 3. Preformed Corner Closures: Furnish to match configuration of gable fascia.
 4. Downspouts:
 - a. Configuration: Nominal 10 cm corrugated rectangular box with minimum 71 square cm of cross-section area.
 - b. Factory finish to match wall panels.
- I. Sealants and Caulking
1. Sealants and caulking shall conform to the following:
 - a. Sealant Type 4: Multipart polyurethane; ASTM C920, Type M, Grade NS, Class 25; Sonolastic NP-II, Pecora Dynatrol II, or Tremco Dymeric.
 - b. Sealant Type 6: One-part polyurethane; ASTM C920, Type S, Grade NS, Class 25; Sonolastic NP-I, Pecora Dynatrol I, or Tremco Dymonic.

- c. Sealant Type 9: One-part acrylic; Tremco Mono, Pecora 60+ Unicrylic, or PTI 738.

- J. Sealant materials shall be delivered to the job in the manufacturer's original unopened containers. The container label or accompanying data sheet shall include the following information as applicable: manufacturer, name of material, formula or specification number, lot number, color, date of manufacture, mixing instructions, shelf life, and curing time at the standard conditions for laboratory tests. Materials shall be handled and stored to prevent inclusion of foreign materials. Materials shall be stored at temperatures between 40 and 80 degrees F unless otherwise specified by the manufacturer. Manufacturer shall also include material safety data sheets (MSDS) for each type of sealant used on site.

- K. Plywood
 - 1. Plywood Grades: U.S. Product Standard PS 1. Identify each plywood panel with appropriate grade trademark of APA-The Engineered Wood Association.

Provide fire-retardant treated plywood panels with grade designation, APA C-C PLUGGED EXT, 2 cm thick, sanded surface.
 - 2. Pressure treat plywood with fire-retardant chemicals in accordance with AWWA Recommended Practice C20 and C27, respectively, so that it has a flame spread rating not higher than 25 with no evidence of significant progressive combustion when tested for 30 minutes duration under the standard Test Method UL 723, NFPA 255, and ASTM E84 and smoke developed 50 or less. Treated lumber and plywood labeled and tested by Underwriters' Laboratories, Inc. showing the performance rating.
 - 3. Fasteners (Lag, Toggle, and Miscellaneous Bolts and Screws) shall conform to ASTM A307. Type, size, and finish best suited for intended use. Screws shall be self-tapping type to connect to structural steel members. Finish options include zinc compounds, cadmium, and aluminum paint impregnated finishes.

- L. Miscellaneous: Furnish fasteners, metal-backed neoprene washers, weather stripping, sealants, roof jacks, roof curbs, gaskets, and other items as required for a complete installation.

2.4 FABRICATION

- A. Factory Fabricate: To manufacturer's written standards, MBMA Low Rise Building Systems Manual, and AISC LRFD Specification for Structural Steel Buildings.

- B. Building Parts: Accurate and true to dimension to facilitate building erection without cutting, fitting, or other alterations.
- C. Welded Connections: In accordance with AWS D1.1/D1.1M and Technical Specification 0600X-SP-C0081 Metals.
- D. Shop Primer for Primary Framing:
 - 1. Clean and apply one coat of manufacturer's standard primer in accordance with MBMA Low Rise Building Systems Manual.

3.0 EXECUTION

3.1 EXAMINATION

- A. Examine supporting concrete foundation and anchor bolt placement for compliance with requirements for installation tolerances and other conditions affecting performance of metal building.

3.2 BUILDING ERECTION

- A. Erect building system in accordance with manufacturer's standards and instructions.
- B. Provide temporary bracing in accordance with MBMA standards and as required for safe installation. The metal building supplier shall incorporate permanent fall protection tie-off points to top of crest pad building roof framing as part of building design.
- C. Structural Framing:
 - 1. Do not field cut or alter primary or secondary framing members.
 - 2. Installation and tolerances shall be in accordance with MBMA Low Rise Building Systems Manual.
- D. Roof and Wall Panels:
 - 1. Field cutting of panels by torch is not permitted.
 - 2. Attach panels to structural supports to maintain a weather tight seal while allowing for thermal and structural movement.
 - a. Install exposed fasteners in true vertical and horizontal alignment.

- b. Field seam side laps of standing seam roof panels using electrically operated seaming machine.
 - c. Use proper tools to install screw fasteners to compress neoprene washer without damaging washer or stripping metal.
3. Install manufacturer's standard joint sealants, gaskets, and closure strips as required for weather tight installation. Sealant shall be used before expiration of shelf life. Multi-component sealants shall be mixed according to manufacturer's printed instructions. Sealant in guns shall be applied with a nozzle of proper size to fit the width of joint. Joints shall be sealed as detailed in the drawings. Sealant shall be forced into joints with sufficient pressure to expel air and fill the groove solidly. Sealant shall be installed to the indicated depth without displacing the backing. Unless otherwise indicated, specified, or recommended by the manufacturer, the installed sealant shall be tooled so that the surface is uniformly smooth and free of wrinkles and to assure full adhesion to the sides of the joint. Sealants shall be installed free of air pockets, foreign embedded matter, ridges and sags. Sealer shall be applied over the sealant when and as specified by the sealant manufacturer.
 4. Field Cutting and Patching: Perform in manner not to impair appearance, weather tightness, or structural capacity of panel system.

3.3 INSTALLATION OF SEALANTS AND CAULKING

- A. Conform to ASTM C1193.
- B. Backup Rod: Install in joints wider than 5 mm.
- C. Seal joints around doors, and louver frames, and as indicated.
- D. Apply materials in accordance with manufacturer's recommendations and instructions.
- E. Fill joints completely from back to face, without voids.
- F. Tool joints concave.
- G. Clean smears and other soiling caused by sealant.
- H. Replace or repair to OWNER's satisfaction damaged surfaces resulting from sealing or cleaning.
- I. Application Schedule:

1. Type 4 or 6: Exterior joints.

a. Type 9: Interior joints.

3.4 INSTALLATION OF PLYWOOD

- A. Plywood shall be applied with tight edges at side and end joints, and screwed at supported edges at 12 inches on center and at intermediate supports 12 inches on center.
- B. Fasteners of edges shall be 1/2 inch from the edges. Furnish where shown on Drawings.

3.5 HARDWARE INSTALLATION AND PROTECTION

- A. Mounting Dimensions: Follow National Builder's Hardware Association Standard; lock and latch backset, 2-3/4 inches.
- B. Follow manufacturer's instructions. Make Work neat and secure, developing full strength of components and providing intended function.
- C. Prevent marring, scratching, or otherwise damaging adjacent finishes during installation.
- D. Set stops over solid backing after painting is complete.
- E. Cope ends of thresholds neatly to jamb profile and set in sealant, anchoring securely.
- F. Do fitting, dismantling, and reinstalling of finish hardware required before and after painting.
- G. After installation, adjust hardware for noise-free operation without resistance.
- H. Protect doors, frames, and hardware from damage after installation.

3.6 HARDWARE SETS

- A. Hardware sets are guide to functional requirements of each opening. Provide hardware complete. Size omitted shall be as recommended by manufacturer.

Item	Type
HDW-1. Single Locked Entrance Door	
1-1/2 Pair butts, 4-1/2 in. by 4-1/2 in.	H1
1 Lock	L1
1 Closer	C6
1 Threshold	T1
1 Set weather-strip	W1
HDW-2. Connecting Interior Door, No Lock	
1-1/2 Pair butts, 4-1/2 in. by 4-1/2 in.	H1
1 Latch	L3
1 Closer	C4
HDW-3. Overhead Coiling Door	
Slide Bolt (provided by Door Manufacturer)	N/A

- B. See Door and Hardware Schedule on Drawings for indication of hardware sets, and door and frame types.

3.7 REPAIR, CLEANING, AND PAINTING

- A. Immediately following erection, remove unused material, screws, fasteners, and other debris from completed installation. Use caution in removing metal cuttings from surface of pre-finished metal panels.
- B. Replace damaged, dented, buckled, or discolored metal panels.
- C. Repair damaged painted and galvanized surfaces as specified in Technical Specification for Finishes.
- D. Finish Painting: As specified in Technical Specification for Finishes.

3.8 CONSTRUCTION QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall maintain records of his quality control for operations including but not limited to the following:

- (1) Inspection of material delivered to the project site against approved material data list(s).
- (2) Storage and handling of materials.
- (3) Installation as required.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be furnished to the CONTRACTOR within 1 working day of the inspection or test.

3.9 MANUFACTURER'S SERVICES

Provide manufacturer's representative at site for installation assistance, inspection, and certification of proper installation.

METALS
CONTENTS

1.0	GENERAL.....	4
1.1	SUMMARY.....	4
1.2	ABBREVIATIONS.....	4
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS.....	4
1.4	DEFINITIONS.....	6
1.5	TECHNICAL SUBMITTALS.....	6
	1.5.1 Shop Drawings.....	7
	1.5.2 Manufacturer's Mill Certificate.....	7
	1.5.3 Mill Test Reports.....	7
	1.5.4 Welder's Qualification and Certificates.....	7
	1.5.5 Weld Inspection Certificates.....	7
	1.5.6 Manufacturer's Standard Painting System Data Sheet.....	7
	1.5.7 Weld Procedure Specification (WPS).....	7
	1.5.8 Written Procedures.....	8
	1.5.9 Documentation.....	8
	1.5.10 Suspect/Counterfeit Warrant.....	8
	1.5.11 Test Reports.....	8
	1.5.12 Notifications.....	8
	1.5.13 Verification of Compliance.....	8
	1.5.14 SUBCONTRACTOR CQC Plan.....	8
	1.5.15 SUBCONTRACTOR QAP.....	8
	1.5.16 MSDSs, Drawings, and Bill of Materials.....	8
1.6	GENERAL REQUIREMENTS FOR FABRICATION AND INSTALLATION..	9
	1.6.1 Welding.....	9
	1.6.2 Structural Steel.....	9
	1.6.3 Non-Load-Bearing Metal Partition Wall Framing.....	9
1.7	WELDING PROCEDURE QUALIFICATIONS.....	9
	1.7.1 Previous Qualifications.....	10
	1.7.2 Prequalified Procedures.....	10
1.8	WELDER, WELDING OPERATOR, AND TACKER QUALIFICATION.....	10
	1.8.1 Previous Qualifications.....	10
	1.8.2 Certificates.....	11
	1.8.3 Renewal of Qualification.....	11
1.9	INSPECTOR QUALIFICATION.....	11
1.10	WELD SYMBOLS.....	12
1.11	SAFETY.....	12
2.0	MATERIAL GRADE QUALITY AND EQUIPMENT.....	12
	2.1 WELDING EQUIPMENT AND MATERIALS.....	12
	2.2 STRUCTURAL STEEL.....	12
	2.3 HIGH STRENGTH BOLTS.....	12
	2.4 CARBON STEEL BOLTS.....	12

2.5	CARBON STEEL NUTS	12
2.6	WASHERS	12
2.7	METAL STUDS, TRACKS AND ACCESSORIES	13
3.0	EXECUTION.....	13
3.1	WELDING OPERATIONS	13
	3.1.1 Requirements	13
	3.1.2 Weld Identification	13
3.2	STANDARDS OF ACCEPTANCE	13
	3.2.1 Nondestructive Examination.....	13
	3.2.2 Destructive Tests.....	14
3.3	VERIFICATION, VALIDATION, AND RECORD KEEPING.....	14
	3.3.1 CONTRACTOR Verification and Validation	14
	3.3.2 Inspection Records.....	14
	3.3.3 Notifications.....	15
3.4	CORRECTIONS AND REWORK.....	15
3.5	STRUCTURAL STEEL FABRICATION	15
3.6	STRUCTURAL STEEL ERECTION.....	16
	3.6.1 Connections.....	16
	3.6.2 Base Plates and Bearing Plates	16
	3.6.3 Field Welded Connections.....	16
	3.6.4 Field Priming	16
3.7	METAL WALL FRAMING ERECTION	16
	3.7.1 Tracks.....	16
	3.7.2 Studs and Other Framing	16
3.8	SHIPPING AND HANDLING.....	17
	3.8.1 Transport Packaging	17
	3.8.2 Use of Strapping and Wood Supports for Storage and Shipment.....	17
	3.8.3 Shipping and Storage of Coating Materials	17
	3.8.4 Material Safety Data Sheets, Drawings, and Bill of Materials	17
	3.8.5 Part Marking of Raw Materials.....	17
3.9	CONSTRUCTION QUALITY CONTROL AND QUALITY ASSURANCE....	18

METALS

1.0 GENERAL

1.1 SUMMARY

This specification establishes quality and workmanship requirements for the supply and installation of metal structures.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meanings:

AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASNT	American Society for Nondestructive Testing
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CQC	Construction Quality Control
MSDS	Material Data Safety Sheet
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Program
SSRS	Subcontractor Submittal Requirements Summary
WAC	Washington Administrative Code
WPS	Welding Procedure Specification

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved by the CONTRACTOR or shown in this specification, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for fabrication, erection, installation and inspection of metal structures. Referenced test methods, specifications, and recommended practices listed below are to be used for material property verification and the identification of acceptable practices applicable to metal structures.

Failure of identifying applicable codes and standards by this specification and by CONTRACTOR does not imply elimination of required knowledge and compliance to perform work by the SUBCONTRACTOR.

AISC 325	Steel Construction Manual, 13th Edition
AISC 360	Specification for Structural Steel Buildings
AISC S303-05	Code of Standard Practice for Steel Buildings and Bridges

AISC S329	Allowable Stress Design Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts
AISC S348	Load and Resistance Factor Design (LRFD) Specification for Structural Joints Using ASTM A325 or A490 Bolts
ANSI/ASME B18.21.1	Lock Washers (Inch Series)
ANSI/ASME B46.1	Surface Texture, Surface Roughness, Waviness and Lay
ANSI/AWS Z49.1	Safety in Welding, Cutting, and Allied Processes
ASNT-01	Recommended Practice SNT-TC-1 A: Personal Qualification and Certification in Nondestructive Testing
ASTM A6/A6M	Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes and Steel Piling
ASTM A36/A36M	Standard Specification for Carbon Structural Steel
ASTM A242/A242M	Standard Specification for High-Strength Low-Alloy Structural Steel
ASTM A307	Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A325	Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
ASTM A490	Standard Specification for Structural Bolts, Alloy Steel, Heat-Treated, 150 ksi Minimum Tensile Strength
ASTM A529/A529M	Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality
ASTM A563	Standard Specification for Carbons and Alloy Steel Nuts
ASTM A572/A572M	Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A992/A992M	Standard Specification for Structural Steel Shapes
ASTM C645	Standard Specification for Nonstructural Steel Framing Members
ASTM C754	Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products

ASTM F436	Standard Specification for Hardened Steel Washers
ASTM F844	Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use
AWS A2.4	Standard Symbols for Welding, Brazing and Nondestructive Examination
AWS A3.0	Standard Welding Terms and Definitions
AWS D1.1	Structural Welding Code – Steel
DOE O 414.1C	Quality Assurance
OSHA 1926	Construction Standards
SSPC Paint 25	Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand-Cleaned Steel
WAC 296-24	General Safety and Health Standards
WCH-56	General Design Criteria Document for River Corridor Closure Contract
0600X-SP-C0079	Specification for Reinforced Concrete for Environmental Restoration Disposal Facility (ERDF) Cells 9, & 10 Construction
0600X-SP-G0048	Specification for Quality Control Requirements for Environmental Restoration Disposal Facility (ERDF) Cells 9, & 10 Construction
0600X-SP-G0049	Specification for Supplier Quality Assurance Program Requirements for Environmental Restoration Disposal Facility (ERDF) Cells 9 & 10 Construction

1.4 DEFINITIONS

Definitions of welding terms shall be in accordance with AWS A3.0

1.5 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I," Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays. The following submittals shall be submitted to CONTRACTOR and approved by the CONTRACTOR prior to procurement, assembly, and installation of any metal structure. Submittals specific to this specification shall include, but not be limited to, the following:

1.5.1 Shop Drawings

- a. Shop detail drawings and erection drawings shall be submitted. Approval of the shop detail drawing codes does not relieve SUBCONTRACTOR of responsibility for compliance with design drawings, specifications, and for completeness and accuracy of all dimensions and details. Titles of shop detail drawings and erection drawings shall correspond to the specific design drawings. Each shop drawing shall include a reference to this specification number and a bill of materials showing the piece mark number, the number of members required, shape designation, detailed length, unit weight of each member, total weight for each member, and total weight of all materials detailed on the drawing. Erection drawings shall show the marking and position of each member, details of all members and their connections, foundation plans for seating anchor bolts and base plates, and bolt schedules for erection. An index of shop details and erection drawings shall be provided. As-built shop detail drawings and erection drawings shall be submitted to the CONTRACTOR after erection is complete.
- b. Welding Procedure in shop and field welding shall be in accordance with AWS D1.1 unless otherwise indicated on the design drawings, and shall be submitted. Weld connections shall be shown using AWS A2.4 welding symbols indicating net weld lengths, locations, and designated field or shop welds. NOTE: AWS D1.1 requires records be kept of welding procedure and welder qualifications.

1.5.2 Manufacturer's Mill Certificate

Certify that products meet or exceed specified requirements.

1.5.3 Mill Test Reports

Manufacturer's certificates indicating structural strength, destructive and non-destructive test analysis.

1.5.4 Welder's Qualification and Certificates

Certified welders employed on the work, verifying AWS qualification within the previous 12 months. See Section 1.8.2.

1.5.5 Weld Inspection Certificates

1.5.6 Manufacturer's Standard Painting System Data Sheet

1.5.7 Weld Procedure Specification (WPS)

1.5.8 Written Procedures

Written procedures for storage, handling, surface preparation, application, touch-up and repair, curing and inspection of coating to be submitted prior to use within 30 days after mobilization for construction.

1.5.9 Documentation

Documentation verifying inspection and non-destructive testing personnel are qualified in accordance with ASNT-SNT-TC-1A for levels I or II in the applicable non-destructive testing material.

1.5.10 Suspect/Counterfeit Warrant

Suppliers to the SUBCONTRACTOR shall warrant that "all items furnished under this Purchase Order/Contract Order are genuine (i.e., not counterfeit) and match the quality, test reports, markings and/or fitness for use required by the Subcontract." The statement shall be on supplier letterhead and signed by an authorized agent of the supplier. Any materials furnished as part of this Subcontract, which have been previously found to be suspect/counterfeit by the Department of Energy shall not be accepted.

1.5.11 Test Reports

See Section 3.3.2.

1.5.12 Notifications

See Section 3.3.3.

1.5.13 Verification of Compliance

See Sections 3.3 and 3.9.

1.5.14 SUBCONTRACTOR CQC Plan

See Specification No. 0600X-SP-G0048.

1.5.15 SUBCONTRACTOR QAP

See Exhibit D.

1.5.16 MSDSs, Drawings, and Bill of Materials

See Section 3.8.4.

1.6 GENERAL REQUIREMENTS FOR FABRICATION AND INSTALLATION

1.6.1 Welding

Welding design, fabrication, installation, inspection and qualification shall conform to AWS D1.1 to meet the design criteria as specified in WCH-56, "General Design Criteria for River Corridor Closure Contract" using AISC 360 Design Guides and Practices unless otherwise specified in the Subcontract. Welding shall not be started until welding procedures, welders, welding operators, and tackers have been qualified and the submittals approved by the CONTRACTOR.

1.6.2 Structural Steel

Structural steel fabrication and erection shall be performed by an organization experienced in structural steel work of equivalent magnitude. The SUBCONTRACTOR shall be responsible for workmanship that conforms to AISC Code of Standard Practice for Steel Building and Bridges, AISC 303-05.

Fabrication, installation, inspection, and qualification of metal structures shall meet the design criteria specified in WCH-56, "General Design Criteria for River Corridor Closure Contract" using AISC 360 Design Guides and Practices unless otherwise specified by this document. Connections, for any part of the structure not shown on the Subcontract drawings, shall be considered simple shear connections and shall be designed and detailed in accordance with AISC-325. Substitution of sections or modification of connection details will not be accepted unless approved by the CONTRACTOR. High-strength bolting shall be in accordance with AISC S329 and meet the Suspect/Counterfeit Item (S/IC) requirements of DOE O 414.1C "Quality Assurance".

1.6.3 Non-Load-Bearing Metal Partition Wall Framing

Fabrication, installation, inspection, and qualification of Non-Load-Bearing Metal Partition Wall Frames shall meet the design criteria specified in WCH-56, "General Design Criteria for River Corridor Closure Contract" using AISC 360 Design Guides and Practices unless otherwise specified in the Subcontract.

Interior, non-load-bearing metal partition wall framing shall be installed by a SUBCONTRACTOR experienced in the installation of light gauge metal stud framing. The SUBCONTRACTOR shall be responsible for workmanship that conforms to AISC Code of Standard Practice for Steel Building and Bridges, AISC 303-05.

1.7 WELDING PROCEDURE QUALIFICATIONS

Except for prequalified procedures and previously qualified procedures submitted under Section 1.5, each welding SUBCONTRACTOR shall qualify the welding procedure specification (WPS) for any welding procedure followed in the fabrication of weldments as detailed in shop and/or erection drawings.

1.7.1 Previous Qualifications

Welding procedures previously qualified by test may be accepted for this Subcontract without requalification if the following conditions are met:

- a. Testing was performed by an approved testing laboratory, technical consultant, or the SUBCONTRACTOR's approved program CQC program.
- b. The qualified welding procedure conforms to the requirements of this specification and is applicable to welding conditions encountered under this Subcontract.
- c. The welder, welding operator, and tacker qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this Subcontract.

1.7.2 Prequalified Procedures

Welding procedures that are considered prequalified as specified in AWS D1.1 will be accepted without further qualification.

1.8 WELDER, WELDING OPERATOR, AND TACKER QUALIFICATION

Each welder, welding operator, and tacker assigned to work on this Subcontract shall be qualified in accordance with the applicable requirements of AWS D1.1 and as specified in this section.

1.8.1 Previous Qualifications

At the discretion of the CONTRACTOR, welders, welding operators, and tackers qualified by test within the previous 6 months may be accepted for this Subcontract without requalification if the following conditions are met:

- a. Copies of the welding procedure specifications, the procedure qualification test records, and the welder, welding operator, and tacker qualification test records are on file with the SUBCONTRACTOR.
- b. An approved testing laboratory, technical consultant, or the SUBCONTRACTOR's approved quality assurance program performed testing.
- c. The previously qualified welding procedure conforms to the requirements of this specification and is applicable to welding conditions encountered under this Subcontract.

- d. The welder, welding operator, and tacker qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this Subcontract.

1.8.2 Certificates

Welder, welding operator, or tacker certification documentation submitted under Section 1.5 shall contain:

- the type of welding and positions for which the welder, welding operator, or tacker is qualified,
- the code and procedure under which the individual is qualified,
- the date when the welder, welding operator, or tacker was qualified, and
- the name of the firm and person certifying the qualification tests.

The certification shall be kept on file with the SUBCONTRACTOR. The certification shall be kept current for the duration of the Subcontract.

1.8.3 Renewal of Qualification

Requalification of a welder or welding operator shall be required under any of the following conditions:

- a. It has been more than 6 months since the welder or welding operator has used the specific welding process for which he is qualified.
- b. There is specific evidence to question the welder or welding operator's ability to make welds that meet the requirements of these specifications.
- c. The welder or welding operator was qualified by an employer other than those firms performing work under this Subcontract, and a qualification test has not been taken within the past 12 months.
- d. A tacker who passes the qualification test shall be considered eligible to perform tack welding indefinitely in the positions and with the processes for which he is qualified, unless there is some specific evidence to question the tacker's ability. In such a case, the tacker shall be required to pass the AWS D1.1 requirements.

1.9 INSPECTOR QUALIFICATION

Inspection and nondestructive testing personnel shall be qualified in accordance with the requirements of ASNT-01 for Levels I or II in the applicable nondestructive testing method. The inspector may be supported by assistant welding inspectors who are not qualified to ASNT-01,

and assistant inspectors may perform specific inspection functions under the supervision of the qualified inspector.

1.10 WELD SYMBOLS

Weld Symbols shall be in accordance with AWS A2.4, unless otherwise indicated.

1.11 SAFETY

Safety precautions during welding shall conform to ANSI Z49.1 and OSHA 1926.

2.0 MATERIAL GRADE QUALITY AND EQUIPMENT

2.1 WELDING EQUIPMENT AND MATERIALS

Welding equipment, electrodes, welding wire, consumables, and fluxes shall be capable of producing satisfactory welds when used by a qualified welder or welding operator performing qualified welding procedures. Welding equipment and materials shall comply with the applicable requirements of AWS D1.1.

2.2 STRUCTURAL STEEL

Carbon grade steel shall conform to the requirements of ASTM A36/A36M, A529/A529M, A572/A572M, or A992/A992M.

2.3 HIGH STRENGTH BOLTS

High strength bolts shall conform to ASTM A325 or ASTM A490 and meet the Suspect/Counterfeit Item (S/IC) requirements of DOE O 414.1C "Quality Assurance".

2.4 CARBON STEEL BOLTS

Carbon steel bolts shall conform to ASTM A307, Grade A or ASTM A325.

2.5 CARBON STEEL NUTS

Carbon steel nuts shall conform to ASTM A563, Grade A, Hex.

2.6 WASHERS

Plain washers shall conform to ASTM F844. Other types, when required, shall conform to ASME B18.21.1.

2.7 METAL STUDS, TRACKS AND ACCESSORIES

Cold-rolled steel 20-gauge galvanized C-studs with 1-5/8-in. flanges, shall conform to ASTM C645.

3.0 EXECUTION

3.1 WELDING OPERATIONS

3.1.1 Requirements

Workmanship and techniques for welded construction shall conform to the requirements of AWS D1.1 and AISC 360. Where AWS D1.1 and the AISC 360 specification conflict, the requirements of AWS D1.1 shall govern.

3.1.2 Weld Identification

Welds shall be identified in one of the following ways:

- a. Written weld records shall be submitted to the CONTRACTOR which indicate the location of welds made by each welder, welding operator, or tacker.
- b. Each welder, welding operator, or tacker shall be assigned a number, letter, or symbol to identify welds made by that individual. The welders, welding operators, and tackers apply their symbol next to the welds performed by them by means of rubber stamp, felt-tipped marker with waterproof ink, or other methods that that does not alter the structural property of the area. For seam welds, the identification mark shall be adjacent to the weld at approximately 1 meter (3-foot) intervals. Identification with die stamps or electric etchers shall not be allowed.

3.2 STANDARDS OF ACCEPTANCE

Dimensional tolerances for welded construction, details of welds and quality of welds shall be in accordance with the applicable requirements of AWS D1.1 and the Subcontract drawings. Nondestructive Evaluation (NDE) shall be the primary method of ensuring structural integrity. The SUBCONTRACTOR'S CQC Plan shall include proposed inspection methods for noted details for CONTRACTOR approval. The minimum extent of nondestructive testing shall be a random 25 percent of welds or joints.

Destructive evaluation can be applied as a means to ensure part structural integrity.

3.2.1 Nondestructive Examination

The welding shall be subject to inspection and tests in the mill, shop, and field as outlined in the SUBCONTRACTOR'S CQC Plan and QAP. Inspection and tests in the mill or shop will not

relieve the SUBCONTRACTOR of the responsibility to furnish weldments of satisfactory quality. When material quality or workmanship do not conform to the SUBCONTRACTOR's CQC Plan or QAP, the CONTRACTOR reserves the right to reject any material lot and/or workmanship at any time before final acceptance of the structure containing the weldment.

3.2.2 Destructive Tests

Destructive evaluation should only be used to ensure structure integrity as practicable. A formal review process initiated by the SUBCONTRACTOR shall be conducted prior to conducting the test as feasible. This review process should be included in the SUBCONTRACTOR's CQC Plan.

Destructive tests can be performed off-site. When metallographic specimens are removed from any part of a structure, the SUBCONTRACTOR shall make repairs to ensure structural integrity where the specimens were removed. The SUBCONTRACTOR shall employ qualified welders or welding operators, and shall use the proper joints and welding procedures, including peening or heat treatment if required, to develop the full strength of the members and joints cut and to relieve residual stress.

3.3 VERIFICATION, VALIDATION, AND RECORD KEEPING

3.3.1 CONTRACTOR Verification and Validation

In addition to the QA/QC practices performed by the SUBCONTRACTOR to ensure structural integrity, the CONTRACTOR will perform inspection and acceptance testing to the extent determined by the CONTRACTOR. The costs of such inspection and testing will be borne by the SUBCONTRACTOR if unsatisfactory welds are discovered, or by the CONTRACTOR if the welds are satisfactory. The work may be performed by the CONTRACTOR or another SUBCONTRACTOR under a separate subcontract. The CONTRACTOR reserves the right to perform supplemental nondestructive and destructive tests to determine compliance with paragraph STANDARDS OF ACCEPTANCE.

3.3.2 Inspection Records

Inspection records and test reports shall be submitted for record prior to shipment and shall include:

- a. Inspection of welds,
- b. Inspection of blast cleaning and coating equipment,
- c. Inspection of surfaces to be blast cleaned and surfaces to be coated,
- d. All other Non-destructive Evaluation (NDE) test performed by SUBCONTRACTOR, and

- e. Coating tests.

3.3.3 Notifications

Notification of shop inspection of witness points is required for the following times:

- a. Start of NDE,
- b. Start of blast cleaning, and
- c. Start of coating inspection.

Notification shall be given verbally and in writing a minimum of two days prior to material availability for shop inspection.

3.4 CORRECTIONS AND REWORK

When inspection or testing indicates defects in the weld joints, the welds shall be reworked using a qualified welder or welding operator as applicable. Corrections shall be in accordance with the requirements of AWS D1.1 and the specifications. Defects shall be reworked in accordance with the approved procedures. Defects discovered between passes shall be reworked before additional weld material is deposited. Wherever a defect is removed and rework by welding is not required, the affected area shall be blended into the surrounding surface to eliminate sharp notches, crevices, or corners.

After a defect is thought to have been removed, and before rewelding, the area shall be examined by suitable methods to insure that the defect has been eliminated. Reworked welds shall meet the inspection requirements for the original welds. Any indication of a defect shall be regarded as a defect, unless reevaluation by nondestructive methods or by surface conditioning shows that no unacceptable defect is present.

3.5 STRUCTURAL STEEL FABRICATION

Fabrication shall be in accordance with the applicable provisions of the AISC 360. Fabrication and assembly shall be done in the shop to the greatest extent possible. The fabricating plant shall be certified under the AISC quality certification program for Category I supplement structural steelwork. Compression joints depending on contact bearing shall have a surface roughness not in excess of 12.7 micrometer (500 micro in.) as determined by ASME B46.1, and ends shall be square within the tolerances for milled ends specified in ASTM A6. Structural steelwork, except surfaces of steel to be encased in concrete, surfaces to be field welded and contact surfaces of friction-type high-strength bolted connections shall be prepared for painting in accordance with the AISC 360 and primed with the specified paint.

3.6 STRUCTURAL STEEL ERECTION

Erection of structural steel shall be in accordance with the applicable provisions of the AISC 360.

3.6.1 Connections

Anchor bolts and other connections between the structural steel and foundations shall be provided and shall be properly located and built into connecting work.

3.6.2 Base Plates and Bearing Plates

Column base plates for columns and bearing plates for beams, girders, and similar members shall be provided. Base plates and bearing plates shall be provided with full bearing after the supported members have been plumbed and properly positioned, but prior to placing superimposed loads. Separate setting plates under column base plates will not be permitted. The area under the plate shall be damp-packed solidly with bedding mortar, except where non-shrink grout is indicated on the drawings. Bedding mortar and grout shall be as specified in the Specification No. 0600X-SP-C0079 Reinforced Concrete.

3.6.3 Field Welded Connections

Field welded structural connections shall be completed before load is applied.

3.6.4 Field Priming

After erection, the field bolt heads and nuts, field welds, and any abrasions in the shop coat shall be cleaned and primed with paint of the same quality as that used for the shop coat.

3.7 METAL WALL FRAMING ERECTION

3.7.1 Tracks

Attach metal runner tracks to floor slabs with 1/4" minimum diameter drilled-in expansion anchors located 2-inches from each end and spaced not more than 24 inches on center (OC). Provide double track (deflection head) at top of wall to allow 3/4-inch deflection of framing. Attach to metal building framing with appropriate self tapping screws. Metal runner to floor slabs/foundation joint shall be sealed.

3.7.2 Studs and Other Framing

Installation shall conform to the requirements of ASTM C754. Stud spacing will be 16 inches on center, unless otherwise noted on the drawings. No splicing of studs will be allowed. Studs will be positioned vertically, and will engage floor and ceiling tracks, and be securely anchored to the track runners by welds, screws or bolts. Double full height studs will be placed on each side of wall openings and will be in direct contact with door and window frame jambs and will be

securely anchored to the jamb and head anchor clips of door or window frames by bolt or screw attachment. Provide 20-gage header track with double channel stiffeners above and below each opening, secured to frame head anchors and double studs.

3.8 SHIPPING AND HANDLING

Shipping and handling for transport and storage shall be outlined in the SUBCONTRACTOR's Quality Assurance Program.

3.8.1 Transport Packaging

All packing, crating, blocking, and bracing shall be adequate to prevent damage to the fabricated material while loading, transport and unloading.

3.8.2 Use of Strapping and Wood Supports for Storage and Shipment

Coated steel shall rest on untreated wooded supports during shop storage and shipment. If it is necessary to stack members, untreated wooden separators shall be used. Coated steel shall at no time be placed directly on other steel, the ground, pavement, or other surface that could damage the steel or the coating. Take precautions to prevent damage to coatings on the surface of the steel.

3.8.3 Shipping and Storage of Coating Materials

Coating materials shall be shipped and stored in accordance with the provisions of this specification.

3.8.4 Material Safety Data Sheets, Drawings, and Bill of Materials

One complete set of erection drawings, shop detail drawings, and bolt list shall accompany the first steel shipment.

Material Safety Data Sheets should be included in the drawing shipment.

3.8.5 Part Marking of Raw Materials

Prior to shipment, all pieces shall be clearly marked indicating the piece number, shop detail or erection drawing number, and other information needed for identification. Marks shall be visible when material is stacked. On members exceeding 30 feet in length, marks shall be placed at both ends and at approximate 20 foot intervals. Material improperly detailed, mismarked, or incorrectly fabricated, so that its erection in the field necessitates extra work, shall be subject to rejection and shall be replaced at no additional cost to CONTRACTOR.

3.9 CONSTRUCTION QUALITY CONTROL AND QUALITY ASSURANCE

Construction Quality Control (CQC) and testing requirements are provided in Specification No. 0600X-SP-G0048. Quality Assurance Program (QAP) requirements are provided in Exhibit "D".

(WPS) rework. A Material Review Process shall be included in the SUBCONTRACTOR's Quality Assurance Plan (QAP) to address non-conformance issues. The material review process shall include a process that furnishes copies in duplicate of the Non-Conformance report, Corrective Action and Error prevention. The CONTRACTOR shall be notified of any non-conformance within 1 working day.

The CONTRACTOR shall also be given copies of test and inspection records within 1 working day for verification & validation concurrence.

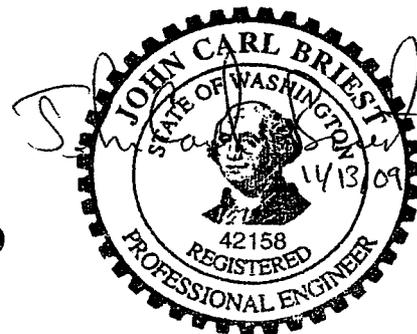
SPECIFICATION FOR

LINED BOLTED STEEL LIQUID STORAGE TANKS

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)

CELLS 9 & 10 CONSTRUCTION

WASHINGTON CLOSURE HANFORD		JOB NO. 14655
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP		
1 <input checked="" type="checkbox"/> Work may proceed. 2 <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3 <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4 <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5 <input type="checkbox"/> Permission to proceed not required.		
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.		
CIVIL GEOTECHNICAL ELECTRICAL MECHANICAL PROCESS NUCLEAR CHEMICAL PIPING OTHER	PROJECT NO. ENVIRONMENTAL WASTE MANAGEMENT SAFETY INDUSTRIAL HYDRAULIC FIRE PROTECTION OR RAILROAD FIELD ENGINEER OTHER	
CHECK REVIEW REQUIREMENT	REVIEWED BY	
W.A. Palau Project Engineer	11-23-2009 Date	
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Washington Closure Hanford, LLC RIVER CORRIDOR CLOSURE CONTRACT			Job No. 14655 Specification No. 0600X-SP-C0082 Page 1 of 15			

DOCUMENT CONTROL *mjp 11/24/09*

LINED BOLTED STEEL LIQUID STORAGE TANK

CONTENTS

1.0	GENERAL.....	3
1.1	SUMMARY.....	3
1.2	ABBREVIATIONS.....	3
1.3	REFERENCES.....	3
1.4	QUALIFICATIONS.....	4
1.5	SUBMITTALS.....	4
	1.5.1 Statements of Qualifications.....	4
	1.5.2 Tank Secondary and Primary Liners.....	4
	1.5.3 Drawings.....	5
	1.5.4 Calculations.....	5
	1.5.5 Design Assessment Report.....	5
	1.5.6 Tank Vendor Information.....	6
	1.5.7 Construction Quality Control.....	6
1.6	DELIVERY AND STORAGE.....	7
1.7	WARRANTY.....	7
2.0	PRODUCTS.....	8
2.1	MANUFACTURER.....	8
2.2	STANDARD PRODUCTS.....	8
2.3	TANK SIZE REQUIREMENTS.....	8
2.4	DESIGN.....	9
	2.4.1 Design Loads.....	9
2.5	TANK COMPONENTS.....	9
	2.5.1 Corrugated Steel Wall Panels.....	9
	2.5.2 Concrete Tank Foundation.....	10
	2.5.3 Tank Secondary and Primary Liners.....	10
	2.5.4 Tank Level and Leak Detection Measurement.....	13
3.0	EXECUTION.....	13
3.1	GENERAL.....	13
3.2	TANK INSTALLATION.....	13
3.3	CONSTRUCTION QUALITY CONTROL.....	13
	3.3.1 Tank System Installation Inspection.....	13
	3.3.2 Tank Liner Inspection.....	14
	3.3.3 Tank Tightness Testing.....	14

LINED BOLTED STEEL LIQUID STORAGE TANK

1.0 GENERAL

1.1 SUMMARY

This Specification sets the minimum standards for design and construction of a lined, bolted liquid storage tank. The tank shall be constructed from corrugated galvanized steel panels bolted together such that no field welding or onsite coating is required. The system shall provide an interior geosynthetic fabric to protect the factory fabricated membrane liner. A tank primary and secondary liner system shall be utilized.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
IR	Information/Record
TCL	Top Capacity Level
VI	Vendor Information

1.3 REFERENCES

The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designations only.

ASTM A653/A653M	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM D413	Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate
ASTM D751	Standard Test Method for Coated Fabrics
AWWA D103	Factory-Coated Bolted Steel Tanks for Water Storage
AWWA D130	Flexible-Membrane Materials for Potable Water Applications
FS 5100	Preservation and Packing of Hand Tools; Tools and Tool Accessories for Power-Driven Metal Woodworking Machinery
IBC	International Building Code

1.4 QUALIFICATIONS

Tank Manufacturer: At least five tanks presently in service, of similar size and character required for the Project, and minimum of 5 years satisfactory operation.

Tank Installer: Certified by tank manufacturer that installer is qualified to do the Work.

Registered Professional Engineer: Licensed in the state of Washington with training and expertise in tank system design and installation. Able to recognize signs of potential tank system failure during the intended operating life of the tank. Able to assess and interpret information on the waste to be stored in the tank and the waste compatibility with the materials used for the tank and piping system.

Installation Inspector: Knowledge of the physical sciences and the principals of engineering acquired by a professional education and related practical experience. Trained and experienced in the proper installation of tank systems or components. Certified by tank manufacturer that the inspector is qualified and experienced in type of Work to be performed.

1.5 SUBMITTALS

See Exhibit I, SUBMITTALS, for submittal procedures.

1.5.1 Statements of Qualifications

Tank manufacturer.

Tank installer.

Registered Professional Engineer.

Installation inspector.

1.5.2 Tank Secondary and Primary Liners

Manufacturer's Data: Manufacturer's descriptive data, specifications sheets, literature, and other data as necessary to fully demonstrate that those materials proposed for use comply with the requirements of these Specifications.

Installation Plan: Submit an installation plan for the liners and cover describing the proposed methods for liner and cover deployment, panel layout, seaming, repair, and protections. The plan shall also include a quality control program for the Construction General Contractor's activities related to liner and cover materials installation.

Factory Fabrication Inspection Data (Source Quality Control): Submit documentation of factory inspection as specified herein.

1.5.3 Drawings

Tank and Equipment: Detailed drawings for tank, anchor bolts and anchor bolt chains, and equipment, such as wall construction, pipe connections, cover, cover connection to tank, secondary containment system, and stilling wells for installation of level controls shall be stamped by the Registered Professional Engineer. Drawings shall include a complete list of equipment and materials, including manufacturer's descriptive and technical literature, and installation instructions.

1.5.4 Calculations

Stamped by the Registered Professional Engineer. Complete structural stress analysis of structural components and connections and anchorage system to the concrete ringwall foundation. Include anchor bolt reaction for all load cases and load combinations.

1.5.5 Design Assessment Report

A written report providing the results of the tank system design assessment prepared and certified by the Registered Professional Engineer attesting the tank has sufficient structural integrity and is acceptable for the storing and treating of dangerous waste.

The assessment report shall contain the following:

1. Site map of the facility showing the proposed location of the tank system within the overall facility.
2. A sketch of the tank system including connected piping and fittings.
3. Structural design standards and criteria used with reference to applicable industry standards and recommended practice codes. Include all calculations for tank, cover, concrete ringwall foundation, and anchoring. Tank shell shall be designed based on full tank. Design parameters used in calculations shall be clearly indicated and labeled on clarifying sketches. Seismic considerations that are appropriate to the seismic risk zone shall be accounted for in the calculations.
4. Description and assessment of the secondary containment system, results of primary liner and secondary liner leak detection surveys, and collection of releases into the secondary containment system; strength of secondary containment system to withstand stresses from static head during a release, climatic conditions, nearby vehicle traffic, and daily operations; description of the leak detection system that will detect the failure of the primary containment structure or the presence of any release of leachate or accumulated liquid in the secondary containment system within 24 hours; a description of the corrosion protection for the exterior surface of the tank.

5. Assessment of ancillary equipment as shown on the Drawings (piping, fittings, flanges, and valves) associated with the tank including support and protection against damage and excessive stress due to excessive settlement, vibration, expansion, or contraction. Verify that peak flows and internal stresses are within the design limits specified by the manufacturer of the ancillary equipment.
6. A statement by the Registered Professional Engineer certifying that the tank system has been adequately designed and that the tank system has sufficient structural strength to ensure that it will not collapse, rupture, or fail under the design conditions. The certification shall include the following statement:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations”.

The Registered Professional Engineer’s signature and stamp must be placed below the certification statement.

1.5.6 Tank Vendor Information

Installation: Tank Installation Instructions

O&M Manual: Submit operating and maintenance instructions prior to completion of the Project. The manual shall include the manufacturer’s cut sheets, parts lists, and a brief description of all equipment and their operating features. Maintenance instructions shall include all routine maintenance procedures, possible breakdowns and repairs, and trouble shooting guide, including recommended preventative maintenance tasks and frequencies for performance of those tasks.

Tank Materials: Submit manufacturer’s cut sheets, parts lists, and a brief description of all equipment and their operating features.

1.5.7 Construction Quality Control

Submit documentation of construction quality control as specified herein:

Installation Inspection Report: A written report prepared by the Installation Inspector or the Registered Professional Engineer documenting the results of the tank system installation inspection. The installation inspection report shall contain the following:

1. The as-built site plan showing the location of the installed tank system.
2. An as-built drawing of the installed tank system including connected piping and concrete ringwall foundation. Tank shall be clearly labeled with ID numbers.
3. Inspection notes, photographs, and any other material used to document inspection activities.
4. An assessment of the tank system for structural damage or inadequate construction/installation including weld breaks, punctures, damage to protective coatings, cracks, and corrosion, and documentation of any defects discovered in materials, equipment, or installation procedures and measurements taken to correct these defects.
5. Documentation of tightness testing results demonstrating the tank system is tight prior to placing it in service.
6. A statement certifying the proper installation of the tank system liner, signed by the liner installer's representative.
7. A signed and dated statement by the Installation Inspector or Registered Professional Engineer certifying the proper installation of the tank system. The certification shall include the following statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations".

1.6 DELIVERY AND STORAGE

All materials and equipment delivered and placed in storage shall be stored with protection from the weather, excessive humidity, and excessive temperature variation; and dirt, dust, or other contaminants. The tank components shall be shipped in crate(s) or pallet(s) designed to prevent physical damage to the tank coating, linings, and structural components.

1.7 WARRANTY

The tank shall have a 1-year warranty from the date of Substantial Completion covering workmanship, materials, all steel components, and the liners and cover system. The warranty

shall provide for correction, or, at the option of the CONTRACTOR, removal and replacement of Work specified in this Specification section found defective during the period of the warranty.

The SUBCONTRACTOR shall provide the manufacturer's written warranty for the liners. The warranty shall be provided to the SUBCONTRACTOR as purchaser with the CONTRACTOR named as beneficiary and shall be signed by an authorized representative of the liner manufacturer. The warranty shall guaranty the liner material for the above-stated period against:

1. Manufacturing defects.
2. Deterioration due to ozone, ultraviolet, and other exposure to the elements, including the stored leachate.
3. Defects in material and factory seams.
4. Defects resulting from installation.

2.0 PRODUCTS

2.1 MANUFACTURER

Dimensions are based on bolted steel tank as manufactured by Environetics, Inc. All dimensions are clearances shall be taken as minimum if an "or equal" tank manufacturer is submitted and approved by the CONTRACTOR. SUBCONTRACTOR shall be responsible for all adjustments required to Drawings as a consequence of changing tank manufacturer.

2.2 STANDARD PRODUCTS

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior the bid opening. Equipment shall be supported by a service organization that is, in the opinion of the CONTRACTOR, reasonably convenient to the site. The items specified under this section shall be furnished by constructors having experience and regular practice in the design, fabrication, and construction of steel tanks.

2.3 TANK SIZE REQUIREMENTS

Number of Tanks: One.

Diameter: 101.46 feet.

Height: 8.17 feet.

Cover Required: Yes, dome structure.

Leachate Volume: 433,000 gallons.

Top Capacity Level (TCL): 7.17 feet above tank floor.

2.4 DESIGN

Design shall be in accordance with the requirements of AWWA D103.

2.4.1 Design Loads

Specific Gravity: The tank shall be designed for liquids with a specific gravity of 1.00.

Earthquake: The tank shall be designed for Seismic Zone 2B per UBC and AWWA D103, site amplification soil profile C, I=1.0. For seismic, use leachate top capacity level (TCL).

Wind Force: The tank shall be designed to the greater requirements of a 100-mph wind with pressure loads as calculated with AWWA D103 or an 85-mph with pressure loads determined using ASCE 7, 198. Wind force calculations shall include wind analysis with an empty tank case as well as a full tank case.

Hydrostatic Pressure: Design tank for static pressure to top of tank shell height.

2.5 TANK COMPONENTS

The tank and liner system shall consist of the following components: Corrugated steel wall panels with anchor embedded in concrete ringwall, geotextile base and wall buffer, secondary containment liner, drainage net, primary liner and dome structure cover, pipe connections, tank ladder, and piping for level and leak detection measurement.

2.5.1 Corrugated Steel Wall Panels

The tank walls shall be constructed from individual corrugated, hot-dip galvanized steel, mill-rolled to finished diameter. Sheet materials shall be ASTM A653/A653M, Grade D, or equal. Sheet materials shall be mill galvanized to ASTM A653/A653M, Class G90 standards, or equal. Shell plate thickness shall be based on AWWA D103 structural requirements. Wall plate thickness shall be a minimum of 12 gauge.

Sheet materials shall receive an electrostatically applied, thermally cured, polyester powdercoat finish. The coating shall be applied in two coats with a minimum dry film thickness of 5.0 mils. The finished coating shall be white in color.

Anchor Bolts: Shall conform to the requirements of AWWA D103.

Bolted Joints: Structural bolts shall conform to the requirements of AWWA D103 and shall be zinc electroplated. Bolted joints shall utilize a minimum two vertical rows as required to withstand structural loads.

Geotextile Base and Wall Buffer: A 16-ounce geotextile polypropylene nonwoven needle-punched fabric shall be placed on the tank floor and wall as a buffer for the liner. The fabric shall be designed to protect the liner from irregular surfaces on the tank wall. The material properties shall conform with the following:

Fabric Property	Unit	Test Method	Value
Grab Tensile Strength	lb	ASTM D4632	425
Grab Elongation	%	ASTM D4632	50
Puncture Strength	lb	ASTM D4833	240
Mullen Burst	psi	ASTM D3786	800
Trapezoid Tear Strength	lb	ASTM D4533	150
Permittivity ^a	sec ⁻¹	ASTM D4491	.57
Water Flow Rate ^a	gpm/sq ft	ASTM D4491	45
AOS	sieve	ASTM D4751	100
UV Resistance	% strength @ 500 hrs	ASTM D4355	70

(a) Minimum average roll values (MARV) for these secondary physical properties shall not exceed specified values.

2.5.2 Concrete Tank Foundation

The tank foundation shall comply with the requirements of specification 0600X-SP-C0079 – Reinforced Concrete.

2.5.3 Tank Secondary and Primary Liners

The liners shall be fabricated from LLDPE. Sheet materials shall have UV resistance and weathering qualities and conform to the following properties:

Physical Property	Physical Values	Test Method
Thickness	30.0 mil min.	ASTM D751
Tear Strength	35/35 lb _f min.	ASTM D4533, Trapezoid Tear
Breaking Yield Strength	550/550 lb _f min.	ASTM D751, Grab Tensile
Low Temperature	Pass @ -30°F	ASTM D1236, 4 hr – 1/8" mandrell
Dimensional Stability	1.5% max. each direction	ASTM D1204, 212°F – 1 hr
Adhesion – Heat Sealed Seam	35 lb _f /2 in min.	ASTM D751, Dielectric Weld

Physical Property	Physical Values	Test Method
Dead Load - Seam Shear Strength	2 in seam, 4 hr, 1 in strip 210 lb _f @ 70°F 105 lb _f min @ 160°F	ASTM D751
Bursting Strength	650 lb _f min. 800 lb _f typical	ASTM D751, Ball Tip
Hydrostatic Resistance	800 psi min.	ASTM D751, Method A
Blocking Resistance	#2 Rating max.	ASTM D751 (180°F/82°C)
Adhesion – Ply	15 lb _f /in min. or Film Tearing Bond	ASTM D413
Bonded Seam Strength	550 lb _f min.	ASTM D751 as modified by NSF 54
Abrasion Resistance	2,000 cycles (min.) before fabric exposure 50 mg/100 cycles max weight loss	ASTM D3389 (H-18 Wheel, 1,000 g load)
Weathering Resistance	8,000 hrs (min.) – No appreciable changes or stiffening or cracking of coating	ASTM G152 & G153
Water Absorption	0.025 kg/m ² max. @ 70°F/21°C 0.14 kg/m ² max. @212°F/100°C	ASTM D471, Section 12, 7 days
Wicking Shelter-Rite® Procedure	1/8 in max.	
Puncture Resistance	250 lb _f min	ASTM D4833
Coefficient of Thermal Expansion/Contraction	8 x 10 ⁻⁶ in/in/°F max.	ASTM D696

Secondary and Primary Tank Liners: Shall be fabricated in a controlled factory environment into complete liners or large prefabricated panels.

Tank Liner Source Quality Control: The tank liner(s) shall be fabricated from standard width sheeting into a full-size fitted liner. The liner(s) shall be thoroughly inspected by the fabricator for flaws in materials or fabrication prior to shipment. Inspection shall be performed by 100 percent visual inspection and proprietary inflation-light test methods. Construction General Contractor shall provide documentation of factory inspections to the CONTRACTOR.

Pipe Penetrations through Floor Liners: Shall utilize fabricated HDPE flatstock and HDPE pipe. Floor penetrations shall not be geomembrane pipe boots.

Dome Structure Cover: The cover shall be a dome structure shall be a water-tight, clear-span, self-supporting from the periphery structure designed to comply with the design requirements specified in Section 2.4. The cover shall be designed and constructed to allow for thermal expansion.

Drainage Net: The floor area of the tank shall be covered with fitted panels of high density polyethylene (HDPE) drainage net with a geotextile laminated to both sides of the drainage net to prevent clogging and to provide a cushion for the HDPE drainage net against the tank liners. The drainage net shall be installed between the primary and secondary liners to convey liquids between the liners to a leak detection sump. Properties for the drainage net and geotextile are as follows:

Physical Properties		Test Method	Physical Value
Combined	Transmissivity, m/sec	ASTM D4716	4×10^{-5} min.
Drainage Net Component	Transmissivity, m/sec	ASTM D4716	1×10^{-3} min.
	Thickness, mil	ASTM D1777	200
	Density g/cm ³	ASTM D1505	0.94
	Tensile Strength, lb/in	ASTM D5034/5035	45
	Carbon Black Content, %	ASTM D1603	2.0
Geotextile Component	Thickness, mil	ASTM D5199	90
	Grab Tensile, lb	ASTM D4632	210
	Puncture Strength, lb	ASTM D4833	135 ± 5 lbs
	AOS, US Sieve	ASTM D4751	80
	Flow Rate, gpm/ft	ASTM D4491	110 ± 10 gpm/ft
	UV Resistance, % retained	ASTM D4355	70

Pipe Connections: Pipe fittings and connections shall be in accordance with manufacturer's requirements for double containment connections. Location of pipe connections shall be as shown on the Drawings.

Tank Ladder: Provide a hot-dipped galvanized steel ladder for access to the cover access hatch. The ladder shall be attached at the top of the tank wall and at its base to the concrete ringwall. The ladder shall be of sufficient height to allow access to the cover access hatch. The ladder shall be located adjacent to the tank level element installation.

Foundation: Tank shell to bear on a Type 1 concrete ringwall per AWWA D103 as shown on the Drawings. A 1-1/2-inch minimum space between the tank bottom and the top of the ringwall shall be filled with a nonshrink grout as specified in 0600X-SP-C0079 – Reinforced Concrete. Cane fiber joint filler shall not be used. Ringwall design is shown on Drawings.

2.5.4 Tank Level and Leak Detection Measurement

Provide as part of tank construction two 2-inch diameter (Schedule 80 PVC) internal (stilling wells) that extend the whole interior operating height of tank, for the purpose of facilitating the installation of a submersible pressure transmitter (in one pipe), and a multipoint level sensor (in the other pipe).

SUBCONTRACTOR shall furnish and install all necessary equipment and personnel to properly support installation of measurement devices (i.e., PVC flanges, straps, and gaskets).

3.0 EXECUTION

3.1 GENERAL

Tank construction shall be in accordance with AWWA D103.

3.2 TANK INSTALLATION

Field erection of a lined bolted steel tank, including, but not limited to, shell plates, pipe connections, awning, primary and secondary containment, and cover shall be in strict accordance with the manufacturer's recommendations including their guidance on environmental factors that could affect the tank installation.

3.3 CONSTRUCTION QUALITY CONTROL

The SUBCONTRACTOR shall establish and maintain a quality control system to assure compliance with contract requirements and shall maintain records of its quality control for all operations including, but not limited to the following:

1. Inspection of materials delivered to project site against approved material data.
2. Storage and handling of materials.
3. Finished appearance.
4. Completion of required testing.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be furnished to the CONTRACTOR with 24 hours following the inspection or test.

3.3.1 Tank System Installation Inspection

The SUBCONTRACTOR shall provide the services of an Installation Inspector or Registered Professional Engineer to provide full-time supervision of the installation of the storage tank. No

work shall be performed without the presence in the field of the Installation Inspector or Registered Professional Engineer. The Installation Inspector or Registered Professional Engineer shall observe and verify that correct materials and procedures are used for the following activities:

1. Visual inspection and testing.
2. Subgrade and foundation preparation.
3. Placement and compaction of backfill.
4. Placement of reinforcing steel and anchor bolts.
5. Concrete Placement.
6. Placement of shop-fabricated tank parts
7. Erection of field-erection tank parts.
8. Installation of tank liner systems. Tank liner inspection requirements are specified herein.
9. Installation of piping, pumping, and other ancillary equipment.
10. Tightness testing.

3.3.2 Tank Liner Inspection

Visual Inspection: 100 percent visual inspection along all seams of the liners.

Air Jet Inspection: 100 percent air jet inspection of all seams.

Any required repairs shall be corrected in accordance with the manufacturer's recommendations. Results of all testing shall be provided to the CONTRACTOR.

Electronic Leak Location Survey: Prior to installing the cover, complete an electronic leak location survey of the secondary and primary liners.

3.3.3 Tank Tightness Testing

Upon completion of tank installation, the tank shall be visually inspected for any signs of physical damage. Any questionable areas shall be repaired in accordance with the manufacturer's instructions. The tank shall be filled with water and let stand for a period of not less than 2 days. The SUBCONTRACTOR shall maintain a level not less than 7.2 feet for the duration of 2 days. Following the 2 days, the SUBCONTRACTOR shall cyclically change the tank water level at a constant rate from 0.5 foot to 7.3 feet for four cycles over the next 28 days.

During the 30 days, there shall be no signs of leakage from a defect in the primary liner to the secondary containment system of the tank. Any leaks discovered by this test shall be corrected by the SUBCONTRACTOR in accordance with the manufacturer's recommendations. The tank system shall be successfully tested before it is accepted. Results of all testing shall be provided to the CONTRACTOR.

The water used for the testing shall be discharged into the storm water control area located approximately 400 feet east of the leachate tanks. The discharge rate shall not exceed 150 gallons per minute, 150,000 gallons per day, and shall not spill over the spillway. The SUBCONTRACTOR shall not discharge without prior approval from the CONTRACTOR. SUBCONTRACTOR shall record and submit discharge rates, quantities, and dates to the CONTRACTOR.

ELECTRICAL WORK

CONTENTS

1.0	GENERAL.....	6
1.1	SUMMARY.....	6
1.2	ABBREVIATIONS.....	6
1.3	REFERENCES.....	6
1.4	CODES, STANDARDS, LAWS, AND REGULATIONS.....	6
1.5	DEFINITIONS.....	10
1.6	TECHNICAL SUBMITTALS.....	10
	1.6.1 Factory Test.....	10
	1.6.2 Field Testing.....	11
	1.6.3 Test Reports.....	11
	1.6.4 Cable Installation Reports.....	11
	1.6.5 Operation and Maintenance Manuals.....	12
1.7	SERVICE CONDITIONS.....	12
1.8	DELIVERY, STORAGE, AND HANDLING.....	12
2.0	MATERIALS AND EQUIPMENT.....	13
2.1	STANDARD PRODUCT.....	13
2.2	NAMEPLATES.....	13
	2.2.1 General.....	13
2.3	CORROSION PROTECTION.....	13
	2.3.1 Aluminum Materials.....	13
	2.3.2 Ferrous Metal Materials.....	13
	2.3.3 Equipment.....	13
	2.3.4 Finishing.....	14
2.4	CABLES AND WIRES.....	14
	2.4.1 Conductor Material.....	14
	2.4.2 Low-Voltage Cables.....	14
	2.4.3 Grounding Cables.....	14
2.5	CABLE JOINTS, TERMINATIONS, AND CONNECTORS.....	14
	2.5.1 Low-Voltage Cable Splices.....	14
2.6	CONDUIT AND DUCTS.....	14
	2.6.1 Metallic Conduit.....	15
	2.6.2 Conduit Sealing Compound.....	15
2.7	PULLBOXES.....	15
2.8	GROUNDING.....	15
	2.8.1 Driven Ground Rods.....	15
	2.8.2 Grounding Conductors.....	15
2.9	CONCRETE AND REINFORCEMENT.....	16
2.10	EXTRA MATERIALS.....	16
2.11	UNIT HEATERS (HORIZONTAL PROPELLER FAN TYPE).....	16
	2.11.1 Construction.....	16
	2.11.2 Heating Elements.....	16
	2.11.3 Enclosure.....	16

2.11.4	Louvers	17
2.11.5	Fans and Motors.....	17
2.11.6	Limit Controls.....	17
2.11.7	Contactors.....	17
2.11.8	Remote Controls	17
2.11.9	Wiring	18
2.12	EXHAUST FANS.....	18
2.12.1	General.....	18
2.12.2	Remote Controls	18
2.13	CIRCUIT BREAKERS.....	18
2.13.1	Molded-Case and Insulated-Case Circuit Breakers	18
2.14	CONDUIT AND TUBING.....	18
2.14.1	Flexible Conduit, Steel and Plastic	18
2.14.2	PVC Coated Rigid Steel Conduit.....	19
2.14.3	Rigid Zinc-Coated Steel.....	19
2.14.4	Rigid Plastic	19
2.15	CONDUIT AND DEVICE BOXES AND FITTINGS	19
2.15.1	Boxes, Metallic Outlet	19
2.15.2	Boxes, Switch (Enclosed), Surface-Mounted	19
2.15.3	Fittings for Conduit and Outlet Boxes	19
2.15.4	Fittings, PVC, for Use with Rigid PVC Conduit and Tubing.....	19
2.16	CONDUIT COATINGS PLASTIC RESIN SYSTEM.....	19
2.17	CONNECTORS, WIRE PRESSURE.....	19
2.17.1	Copper Conductors	19
2.18	ELECTRICAL GROUNDING AND BONDING EQUIPMENT.....	19
2.19	ENCLOSURES.....	20
2.19.1	Cabinets and Boxes.....	20
2.20	LUMINAIRES, LIGHTING, AND FIXTURE ACCESSORIES/COMPONENTS	20
2.20.1	Fluorescent.....	20
2.20.2	High-Intensity-Discharge.....	20
2.21	FUSES AND FUSEHOLDERS.....	20
2.21.1	Fuses, Low Voltage Cartridge Type	20
2.21.2	Fuseholders	21
2.22	MOTORS, AC, FRACTIONAL AND INTEGRAL HORSEPOWER	21
2.22.1	Motor Efficiencies	21
2.22.2	Motor Controls and Motor Control Centers.....	21
2.23	PANELBOARDS	21
2.24	RECEPTACLES	22
2.24.1	Ground Fault Interrupters	22
2.25	SERVICE EQUIPMENT.....	22
2.26	SPLICE, CONDUCTOR	22
2.27	SNAP SWITCHES	22
2.28	TAPES	22
2.28.1	Plastic Tape.....	22

2.28.2	Rubber Tape.....	22
2.29	TRANSFORMERS.....	22
2.29.1	Conventional Dry-Type.....	22
2.30	WIRING DEVICES.....	22
2.31	LEVEL MEASUREMENT.....	23
2.31.1	Submersible Transducer for Sumps.....	23
2.32	DATA LOGGER (N/A).....	24
2.33	PROGRAMMABLE LOGIC CONTROLLER (PLC).....	24
2.34	TELEMETRY CONTROL SYSTEM.....	24
3.0	EXECUTION.....	24
3.1	GENERAL INSTALLATION REQUIREMENTS.....	24
3.1.1	Conformance to Codes.....	24
3.1.2	Verification of Work, Dimensions, and Construction Sequencing.....	25
3.2	CABLE INSTALLATION.....	25
3.2.1	Cable Installation Plan and Procedure.....	26
3.2.2	Duct Line.....	27
3.2.3	Electric Pullboxes.....	27
3.3	DUCT LINES.....	27
3.3.1	Requirements.....	27
3.3.2	Treatment.....	27
3.3.3	Concrete Encasement.....	28
3.3.4	Nonencased Direct-Burial.....	28
3.3.5	Installation of Couplings.....	28
3.3.6	Duct Line Markers.....	28
3.4	PULLBOXES.....	29
3.4.1	General.....	29
3.4.2	Electric Pullboxes.....	29
3.4.3	Signal Pullboxes.....	29
3.4.4	Ground Rods.....	29
3.5	PAD-MOUNTED EQUIPMENT INSTALLATION.....	29
3.5.1	Concrete Pads.....	30
3.6	CONNECTIONS TO BUILDINGS.....	30
3.7	GROUNDING (Utility Side).....	30
3.7.1	Grounding Electrodes.....	30
3.7.2	Grounding and Bonding Connections.....	31
3.7.3	Grounding and Bonding Conductors.....	31
3.7.4	Pullbox Grounding.....	31
3.8	UNIT HEATERS AND EXHAUST FANS.....	32
3.9	GROUNDING (Service Side).....	32
3.9.1	Ground Bus.....	32
3.9.2	Grounding Conductors.....	32
3.10	WIRING METHODS.....	32
3.10.1	General Requirements.....	32
3.10.2	Conduit Systems.....	32
3.10.3	Cables and Conductors.....	33

3.11	BOXES AND SUPPORTS.....	34
	3.11.1 Pull Boxes.....	34
	3.11.2 Conduit Stub-Ups.....	35
3.12	DEVICE PLATES.....	35
3.13	RECEPTACLES.....	35
	3.13.1 Duplex.....	35
	3.13.2 Weatherproof.....	35
3.14	WALL SWITCHES.....	35
3.15	SERVICE EQUIPMENT.....	36
3.16	PANELBOARDS AND LOADCENTERS.....	36
	3.16.1 Loadcenters.....	36
	3.16.2 Panelboards.....	36
3.17	FUSES.....	36
3.18	UNDERGROUND SERVICE CONDUITS.....	36
3.19	MOTORS.....	37
3.20	MOTOR CONTROL.....	37
	3.20.1 Motor Control Centers.....	38
	3.20.2 Contacts.....	38
3.21	MOTOR-DISCONNECT MEANS.....	38
3.22	TRANSFORMERS.....	38
	3.22.1 Conventional Dry-Type Transformers.....	38
3.23	LAMPS AND LUMINAIRES.....	39
	3.23.1 Lamps.....	39
	3.23.2 Accessories.....	39
3.24	EQUIPMENT CONNECTIONS.....	39
	3.24.1 Motors and Motor Control.....	39
3.25	SEISMIC SUPPORTS.....	39
3.26	PAINTING AND FINISHING.....	39
3.27	REPAIR OF EXISTING WORK.....	39
3.28	IDENTIFICATION NAMEPLATES.....	40
3.29	FIELD TESTING.....	40
	3.29.1 General.....	40
	3.29.2 Safety.....	41
	3.29.3 Ground-Resistance Tests.....	41
	3.29.4 Low-Voltage Cable Test.....	41
3.30	MANUFACTURER'S FIELD SERVICE.....	42
	3.30.1 Onsite Training.....	42
	3.30.2 Installation Engineer.....	42
3.31	ACCEPTANCE.....	42
3.32	QUALITY ASSURANCE/QUALITY CONTROL.....	42
3.33	TELEMETRY CONTROL SYSTEM.....	43

ATTACHMENT A TRENCH PUMP CONTROL SYSTEM
PROGRAMMABLE LOGIC CONTROLLER (PLC) CONTROL LOGIC

ELECTRICAL WORK

1.0 GENERAL

1.1 SUMMARY

This specification establishes quality and workmanship requirements and defines how quality is measured for Electrical Work

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
DOE	Department of Energy
FS	Federal Specifications
IEEE	Institute of Electrical and Electronic Engineers
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Plan
SSRS	Subcontractor/Supplier Submittal Requirements Summary
UL	Underwriters Laboratories

1.3 REFERENCES

DOE 6430.1A, DIV 16	United States DOE General Design Criteria, Electrical
IEEE Std 81	Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
IEEE Std 100	IEEE Standard Dictionary of Electrical and Electronics Terms
CFR 47 Part 18	Industrial, Scientific, and Medical Equipment

1.4 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Electrical Work. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Electrical

Work. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ANSI C80.1	Electrical Rigid Steel Conduit (ERSC)
ANSI C82.4	American National Standard for Ballasts for High-Intensity Discharge and Low-Pressure Sodium (LPS) Lamps (Multiple-Supply Type)
ANSI C119.1	American National Standard for Electrical Connectors—Sealed Insulated Underground Connector Systems Rated 600 Volts
ANSI/NEMA FB 1	Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable
ASTM A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B117	Standard Specification for Operating Salt Spray (Fog) Apparatus
ASTM D1654	Standard Test Methods for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
DOE-STD0-1066-99	Fire Protection Design Criteria
FS L-C-530	Coating, Pipe, Thermoplastic Resin
FS L-P-387	Plastic Sheet, Laminated, Thermosetting (for Designation Plates)
FS W-S-610/ A-A-59213	Splice Connectors
IEEE C2	National Electrical Safety Code
IEEE C57.12.50	Requirements for Ventilated Dry-Type Distribution Transformers, 1 to 500 kVa, Single-Phase, and 15 to 500 kVa, Three-Phase, with High Voltage 601 to 34,500 Volts, Low Voltage 120 to 600 Volts

IEEE C62.41	IEEE Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits
NEMA 250	Enclosures for Electrical Equipment (1000 Volts Maximum)
NEMA AB 1	Molded Case Circuit Breakers, Molded Case Switches, and Circuit Breaker Enclosures
NEMA FU 1	Low Voltage Cartridge Fuses
NEMA ICS 1	Industrial Control and Systems: General Requirements
NEMA ICS 2	Industrial Control and Systems: Controllers, Contactors, and Overload Relays Rated 600 Volts
NEMA ICS 3	Industrial Control and Systems: Medium Voltage Controllers Rated 2001 to 7200 Volts AC
NEMA ICS 6	Industrial Control and Systems: Enclosures
NEMA MG 1	Motors and Generators
NEMA MG 10	Energy Management Guide for Selection and Use of Fixed Frequency Medium AC Squirrel-Cage Polyphase Induction Motors
NEMA OS 1	Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports
NEMA PB 1	Panelboards
NEMA RN 1	Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
NEMA TC 2	Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA TC 7	Smooth-Wall Coilable Electrical Polyethylene Conduit
NEMA WD 1	General Color Requirements for Wiring Devices
NEMA WD 6	Wiring Devices - Dimensional Requirements
NFPA 70	National Electrical Code
NFPA 70E	Standard for Electrical Safety in the Workplace

NFPA 101	Life Safety Code
OSHA 29CFR1910	General Industry Regulations
UL 1	Flexible Metal Conduit
UL 6	Electrical Rigid Metal Conduit - Steel
UL 20	General-Use Snap Switches
UL 44	Thermoset-Insulated Wires and Cables
UL 50	Enclosures for Electrical Equipment
UL 67	Panelboards
UL 83	Thermoplastic-Insulated Wires and Cables
UL 98	Enclosed and Dead-Front Switches
UL 360	Liquid-Tight Flexible Steel Conduit
UL 467	Grounding and Bonding Equipment
UL 486A/486B	Wire Connectors
UL 486C	Splicing Wire Connectors
UL 489	Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures
UL 508	Industrial Control Equipment
UL 510	Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
UL 512	Fuseholders
UL 514A	Metallic Outlet Boxes
UL 514B	Conduit, Tubing, and Cable Fittings
UL 542	Lampholders, Starters, and Starter Holders for Fluorescent Lamps
UL 651	Schedule 40 and 80 Rigid PVC Conduit

UL 719	Non-Metallic Sheathed Cables
UL 845	Motor Control Centers
UL 869A	Reference Standard for Service Equipment
UL 935	Fluorescent Lamp Ballasts
UL 943	Ground-Fault Circuit Interrupters
UL 1004	Electric Motors
UL 1029	High-Intensity-Discharge Lamp Ballasts
UL 1030	Sheathed Heating Element
UL 1242	Electrical Intermediate Metal Conduit-Steel
UL 1561	Dry-Type General Purpose and Power Transformers
UL 1570	Fluorescent Lighting Fixtures
UL 1660	Liquid-Tight Flexible Nonmetallic Conduit

1.5 DEFINITIONS

Electrical and electronic terms used in this specification are as defined in IEEE Std 100.

1.6 TECHNICAL SUBMITTALS

All required Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS). A summary of all required submittals will be assembled and listed in Exhibit "I". Submittals that do not meet the project requirements will be rejected. Rejected submittals shall be resubmitted in a timely manner to avoid delays.

1.6.1 Factory Test

Certified factory test reports shall be submitted when the manufacturer performs routine factory tests, including tests required by standards listed in paragraph REFERENCES. Results of factory tests performed shall be certified by the manufacturer, or an approved testing laboratory, and submitted within 7 days following successful completion of the tests specified in applicable publications or in these specifications. The manufacturer's pass-fail criteria for tests specified in paragraph FIELD TESTING shall be included.

1.6.2 Field Testing

A proposed field test plan, 20 days prior to testing the installed system. No field test shall be performed until the test plan is approved. The test plan shall consist of complete field test procedures including tests to be performed, test equipment required, and tolerance limits.

1.6.3 Test Reports

Three copies of the information described below in 8 1/2 by 11 inches binders having a minimum of 3 rings from which material may readily be moved and replaced, including a separate section for each test. Heavy plastic dividers with tabs shall separate sections.

- a. A list of equipment used, with calibration certifications.
- b. A copy of all measurements taken.
- c. The dates of testing.
- d. The equipment and values to be verified.
- e. The condition specified for the test.
- f. The test results, signed and dated.
- g. A description of adjustments made.

1.6.4 Cable Installation Reports

Three copies of the information described below in 8 1/2 by 11 inches binders having a minimum of 3 rings from which material may readily be removed and replaced, including a separate section for each cable pull. Heavy plastic dividers with tabs shall separate sections, with data sheets signed and dated by the person supervising the pull.

- a. Site layout drawing with all cable pulls numerically identified.
- b. A list of equipment used, with calibration certifications. The manufacturer of and quantity of lubricant used on pull.
- c. The cable manufacturer and type of cable.
- d. The dates of cable pulls, time of day, and ambient temperature.
- e. The lengths of cable pull and calculated cable pulling tensions.

- f. The actual cable pulling tensions encountered during pull.

1.6.5 Operation and Maintenance Manuals

Three copies of Operation and Maintenance manuals, within 7 calendar days following the completion of test and including assembly, installation, operation and maintenance instructions, spare parts data which provides supplier name, current cost, catalog order number, and a recommended list of spare parts to be stocked. Manuals shall also include data outlining detailed procedures for system startup and operation, and a troubleshooting guide that lists possible operational problems and corrective action to be taken. A brief description of all equipment, basic operating features, and routine maintenance requirements shall also be included. Documents shall be bound in a binder marked or identified on the spine and front cover. A table of contents page shall be included and marked with pertinent Subcontract information and contents of the manual. Tabs shall be provided to separate different types of documents, such as catalog ordering information, drawings, instructions, and spare parts data. Index sheets shall be provided for each section of the manual when warranted by the quantity of documents included under separate tabs or dividers.

1.7 SERVICE CONDITIONS

Items provided under this section shall be specifically suitable for the following service conditions:

- a. Altitude 700 feet
- b. Ambient Temperature minus 5 degrees F to 110 degrees F
- c. Frequency 60 Hz
- d. Seismic Zone 2B

1.8 DELIVERY, STORAGE, AND HANDLING

Devices and equipment shall be visually inspected by the SUBCONTRACTOR when received and prior to acceptance from conveyance. Stored items shall be protected from the environment in accordance with the manufacturer's published instructions. Damaged items shall be replaced.

2.0 MATERIALS AND EQUIPMENT

2.1 STANDARD PRODUCT

Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacturer of the product and shall essentially duplicate items that have been in satisfactory use for at least two years prior to bid opening. Use shall include applications of equipment and materials under similar circumstances and of typical design and rating. Items of the same classification shall be identical. Equipment items provided shall be capable of being serviced by an organization that is, in the opinion of the CONTRACTOR, reasonably convenient to the site.

2.2 NAMEPLATES

2.2.1 General

Each major component of this specification shall have the manufacturer's name, address, type or style, model or serial number, and catalog number on a nameplate securely attached to the equipment. Nameplates shall be provided for transformers, circuit breakers, meters, switches, and lighting panels as shown on the drawings.

In addition, all new conduits shall have a permanent label attached at each end and at intermediate enclosures with the conduit's unique identifier. New manholes shall have a permanent label attached to the cover with its unique identifier.

2.3 CORROSION PROTECTION

2.3.1 Aluminum Materials

Aluminum shall not be used.

2.3.2 Ferrous Metal Materials

2.3.2.1 Hardware Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A153/A153M and ASTM A123/A123M.

2.3.3 Equipment

Equipment and component items shall be provided with corrosion-resistant finishes which shall withstand 120 hours of exposure to the salt spray test specified in ASTM B117 without loss of paint or release of adhesion of the paint primer coat to the metal surface in excess of 1/16 inches from the test mark. The scribed test mark and test evaluation shall be in accordance with ASTM D1654 with a rating of not less than 7 in accordance with TABLE 1, (procedure A). Cut edges or otherwise damaged surfaces of hot-dip galvanized sheet steel or mill galvanized sheet steel shall be coated with a zinc rich paint conforming to the manufacturer's standard.

2.3.4 Finishing

Painting required for surfaces not otherwise specified and finish painting of items only primed at the factory shall be as specified in the Technical Specification for Coatings and Finishes.

2.4 CABLES AND WIRES

Conductors in cables shall be annealed copper. Cables shall be single-conductor Class B stranded type, unless otherwise indicated. Cables and wires shall conform to UL 44 for rubber-insulated type; UL 83 for the thermoplastic-insulated type; and UL 719 for the nonmetallic-sheathed cables.

2.4.1 Conductor Material

Underground cables shall be of soft drawn copper conductor material.

2.4.2 Low-Voltage Cables

2.4.2.1 In Duct Cables shall be single-conductor cable, Type XHHW in accordance with NFPA 70. Cables in factory-installed, coilable-plastic-duct assemblies shall conform to NEMA TC 7.

2.4.3 Grounding Cables

See Grounding section of this specification.

2.5 CABLE JOINTS, TERMINATIONS, AND CONNECTORS

2.5.1 Low-Voltage Cable Splices

Low-voltage cable splices and terminations shall be rated at not less than 600 Volts. Splices in conductors No. 10 AWG and smaller shall be made with an insulated, solderless, pressure type connector, Type I, Class 1, Grade B, Style G, or Type II, Class 1 of FS W-S-610 and conforming to the applicable requirements of UL 486A. Splices in conductors No. 8 AWG and larger shall be made with noninsulated, solderless, pressure type connector, Type II, Class 2 of FS W-S-610, conforming to the applicable requirements of UL 486A and UL 486B. Splices shall then be covered with an insulation and jacket material equivalent to the conductor insulation and jacket. Splices below grade or in wet locations shall be sealed type conforming to ANSI C119.1 or shall be waterproofed by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductors.

2.6 CONDUIT AND DUCTS

Duct lines shall be concrete-encased unless specified or shown otherwise. Single duct low-voltage lines or communication lines may be direct-burial.

2.6.1 Metallic Conduit

Intermediate metal conduit shall comply with UL 1242. Rigid galvanized steel conduit shall comply with UL 6 and ANSI C80.1. Metallic conduit fittings and outlets shall comply with UL 514A and NEMA FB 1.

2.6.1.1 Concrete Encased Ducts. UL 651 Schedule 40.

2.6.1.2 Direct Burial, floor slab and walls. UL 651 Schedule 80.

2.6.2 Conduit Sealing Compound

Compounds for sealing ducts and conduit shall have a putty-like consistency workable with the hands at temperatures as low as 35 degrees F, shall neither slump at a temperature of 300 degrees F, nor harden materially when exposed to the air. Compounds shall adhere to clean surfaces of fiber or plastic ducts; metallic conduits or conduit coatings; concrete, masonry, or lead; any cable sheaths, jackets, covers, or insulation materials; and the common metals. Compounds shall form a seal without dissolving, noticeably changing characteristics, or removing any of the ingredients.

Compounds shall have no injurious effect upon the hands of workmen or upon materials. Compound shall not have any injurious effect on cables or wires insulation or jacket routed through the sealing compound. Compound shall be evaluated for any effects on ampacities of cable or wires that would require a correction factor be applied.

2.7 PULLBOXES

Pullboxes shall be of type and size as shown on drawings. Concrete pullboxes shall consist of precast reinforced concrete boxes, extensions, bases, and covers. Frames and covers shall be galvanized.

2.8 GROUNDING

2.8.1 Driven Ground Rods

Ground rods shall be copper-clad steel conforming to UL 467 C135.30 not less than 5/8 inches in diameter by 8 feet in length or as shown on drawings. Sectional type rods may be used.

2.8.2 Grounding Conductors

Grounding conductors shall be bare. Bare conductors shall be ASTM B8 soft-drawn copper unless otherwise indicated. Aluminum is not acceptable.

2.9 CONCRETE AND REINFORCEMENT

Concrete shall be a minimum of 4000 psi at 28 days. Concrete color shall be red. Concrete reinforcing shall be as shown on drawings and as specified in the Technical Specification for Reinforced Concrete.

2.10 EXTRA MATERIALS

One additional spare fuse or fuse element for each furnished fuse or fuse element shall be delivered to the CONTRACTOR when the electrical system is accepted. Two complete sets of special tools required for maintenance shall be provided, complete with a suitable tool box. Special tools are those that only the manufacturer provides, for special purposes (to access compartments, or operate, adjust, or maintain special parts).

2.11 UNIT HEATERS (HORIZONTAL PROPELLER FAN TYPE)

2.11.1 Construction

Unit heaters shall have input wattage, voltage, phase, output wattage (Btu/hr output), cfm air delivery, number of steps, and mounting height as shown or as specified. Unit heaters 3 kW and larger shall be three-phase. Complete unit heater assembly shall comply with the requirements of UL 1025 and the requirements specified. Each unit heater shall be provided with terminals for control circuits and a single source of power as necessary. Control transformers, where required, shall be factory installed and of adequate capacity. Electrical load for three-phase heaters shall be balanced between phases. Maximum discharge air temperature shall not exceed 140 degrees F when inlet air temperature is 60 degrees F.

2.11.2 Heating Elements

Heater shall be rated 3 kW, 120/208 V, 3 phase. Heating elements shall consist of nickel-chromium heating wire embedded in magnesium-oxide insulating refractory and sealed in corrosion-resisting metallic sheath with fins. The ends of elements shall be sealed and enclosed in terminal box, and element sheath shall be mechanically pressed after filling to ensure maximum magnesium oxide compaction. Sheath and fins shall be cast aluminum or steel with fins brazed to sheath. Castings shall be free from defects of any nature. Steel sheath and fins shall be stainless steel or be corrosion protected by high-temperature ceramic coating. Heat transfer between sheath and fins shall be uniform. Fins shall be spaced a maximum of six per inch and fin surface temperature at any point shall not exceed 550 degrees F during normal operation. Elements shall be free from expansion noise and 60-cycle hum.

2.11.3 Enclosure

Heated fan, motor, and auxiliaries shall be contained in a housing. All metal surfaces of housing shall be not less than 18 US gauge. Housings shall have the manufacturer's standard factory baked enamel finish. All parts shall be rigidly braced with heavy steel plates or structural steel

shapes to prevent vibration and maintain alignment. Housing design shall provide ready access to interior parts without unfastening housing from mounting bracket. Each unit heater shall develop the floor area coverage and air throw required by the heater layout shown. The floor area coverage and air throw data shall be included on the detail drawing submittal.

2.11.4 Louvers

Horizontal air discharge units shall have individually adjustable horizontal louvers to direct discharge air horizontally as desired. A louvered back, heavy grille, or wire guard shall be provided for inlet air. Vertical air discharge units shall be provided with individually adjustable louvers so that airflow pattern can be adjusted in all directions. Discharge cones or diffusers shall be substituted where required.

2.11.5 Fans and Motors

Fans shall be the propeller type direct connected to fan motor, dynamically balanced, and designed specifically for unit heater application and low noise level. Sleeve type bearings shall have ample provisions for lubrication and oil reservoir, and shall be effectively sealed against loss of lubrication and entrance of dirt. Ball and roller type bearings shall be sealed, self-aligning and permanently lubricated. Fan motor shall be totally enclosed; continuous duty with built-in manually reset thermal overload protection. Motors 1/2 horsepower and larger shall be three-phase unless otherwise shown. Single-phase motors shall be permanent split capacitor, capacitor-start, or shaded pole type. Motor shall operate from the same power supply as the heater, and at the same voltage unless a factory-furnished step-down transformer is provided. Motor speed shall not exceed 1800 rpm.

2.11.6 Limit Controls

Manual reset thermal overheat protection of unit shall be provided to protect against overheating of the unit and mounted in a convenient location.

2.11.7 Contactor

Unit shall have factory-installed magnetic contactor, for remote thermostatic operation, which shall disconnect all ungrounded conductors to the heater. Contactor shall be rated for 100,000 cycle duty. A control transformer shall be provided when necessary to supply 120-volt thermostat control circuit for each heater.

2.11.8 Remote Controls

Room thermostat for pilot duty shall be internal to the unit. Thermostat shall have an approximate range of from 55 to 85 degrees F and an operating differential of 3 degrees F or less. Provide a non-fused safety disconnect switch near the heater as shown.

2.11.9 Wiring

Unit heaters shall be furnished complete, factory prewired to terminal strips, ready to receive branch circuit and control connections.

2.12 EXHAUST FANS

2.12.1 General

Fans shall include all units shown and shall be 1/3 HP minimum, 115 VAC, single-phase propeller type. Fans shall be complete with motors, safety cages, vibration isolators, and necessary accessories. Fans shall be suitable for continuous operation. Exhaust fans shall be supported on metal frames for mounting, with safety guards. Wall openings and louvers shall be of sufficient size for the fan capacity.

2.12.2 Remote Controls

Exhaust fans shall be operated remotely by a wall thermostat located as shown on drawings. Thermostat range shall be a minimum of 75 degrees F to 110 degrees F. Thermostats shall be HP rated for controlling the fans specified.

2.13 CIRCUIT BREAKERS

Circuit breakers shall have voltage, current and interrupting ratings as indicated.

2.13.1 Molded-Case and Insulated-Case Circuit Breakers

NEMA AB 1 for circuit breakers,

Molded-Case Circuit Breakers: Single-pole breakers shall be full module size; two poles shall not be installed in a single module. Multipole breakers shall be of the common-trip type having a single operating handle, but for sizes of 100 amperes or less may consist of single-pole breakers permanently factory assembled into a multipole unit having an internal, mechanical, nonamperable common-trip mechanism and external handle ties. Breakers shall have interchangeable, adjustable magnetic trips in 225 amperes frame and larger. Breakers coordinated with current-limiting fuses shall have a combined interrupting capacity of 100,000 symmetrical amperes. All poles of associated breakers shall open if any fuse blows.

2.14 CONDUIT AND TUBING

2.14.1 Flexible Conduit, Steel and Plastic

General-purpose type, UL 1; liquid tight, UL 360, and UL 1660

2.14.2 PVC Coated Rigid Steel Conduit

NEMA RN 1.

2.14.3 Rigid Zinc-Coated Steel

UL 6.

2.14.4 Rigid Plastic

NEMA TC 2, UL 651 and UL 651A

2.15 CONDUIT AND DEVICE BOXES AND FITTINGS

2.15.1 Boxes, Metallic Outlet

NEMA OS 1 and UL 514A

2.15.2 Boxes, Switch (Enclosed), Surface-Mounted

UL 98.

2.15.3 Fittings for Conduit and Outlet Boxes

UL 514B.

2.15.4 Fittings, PVC, for Use with Rigid PVC Conduit and Tubing

UL 514B.

2.16 CONDUIT COATINGS PLASTIC RESIN SYSTEM

FS L-C-530 or NEMA RN 1, Type A-40

2.17 CONNECTORS, WIRE PRESSURE

2.17.1 Copper Conductors

UL 486A

2.18 ELECTRICAL GROUNDING AND BONDING EQUIPMENT

UL 467

2.19 ENCLOSURES

NEMA ICS 6 or NEMA 250 unless otherwise specified

2.19.1 Cabinets and Boxes

UL 50

2.20 LUMINAIRES, LIGHTING, AND FIXTURE ACCESSORIES/COMPONENTS

Luminaires, accessories and components, including ballasts, lampholders, lamps, starters and starter holders, shall conform to industry standards specified below.

2.20.1 Fluorescent

- a. Fixture: UL 1570. Luminaires shall be plainly marked for proper lamp and ballast type to identify lamp diameter, wattage, color and start type. Marking shall be readily visible to service personnel, but not visible from normal viewing angles.
- b. Electronic Ballast. Electronic ballasts shall consist of a rectifier, high frequency inverter, and power control and regulation circuitry. The ballasts shall be UL listed, Class P, with a Class A sound rating and shall contain no PCBs. Ballasts shall meet CFR 47 Part 18 for electromagnetic interference and shall not interfere with the operation of other electrical equipment. Design shall withstand line transients per IEEE C62.41, Category A, unless otherwise indicated; the minimum number of ballasts shall be used to serve each individual fixture, using two lamp ballasts. A single ballast may be used to serve multiple luminaires if they are continuous mounted, factory manufactured for that installation with an integral wireway and are identically controlled.
- c. Lampholders, Starters, and Starter Holders: UL 542.

2.20.2 High-Intensity-Discharge

- a. High-intensity-discharge lamps shall be the high-pressure sodium type unless otherwise indicated, shown, or approved.
- b. Ballasts: ANSI C82.4 for multiple supply types and UL 1029.

2.21 FUSES AND FUSEHOLDERS

2.21.1 Fuses, Low Voltage Cartridge Type

NEMA FU 1.

2.21.2 Fuseholders

UL 512.

2.22 MOTORS, AC, FRACTIONAL AND INTEGRAL HORSEPOWER

Motors, ac, fractional and integral horsepower shall conform to NEMA MG 1 and UL 1004 for motors; and NEMA MG 10 for energy management selection of polyphase motors. Polyphase motors shall comply with NEMA Design B. Single-phase motors 1/8 hp and smaller shall be shaded pole or permanent split capacitor; those larger than 1/8 hp shall be capacitor start. Submersible motors shall conform to applicable NEMA MG 1 standards and shall be as specified under driven equipment specifications.

2.22.1 Motor Efficiencies

All permanently wired polyphase motors of 1 hp or more shall meet the minimum full-load efficiencies as indicated in the following table, and as specified in this specification. Motors of 1 hp or more with open, drip-proof or totally enclosed fan cooled enclosures shall be high efficiency type, unless otherwise indicated. Motors provided as an integral part of motor driven equipment are excluded from this requirement if a minimum seasonal or overall efficiency requirement is indicated for that equipment by the provisions of another section.

Minimum Motor Efficiency

<u>HP</u>	<u>Std. Efficiency</u>	<u>High Efficiency</u>
1	77.0	85.5
1.5	78.5	85.5
2	78.5	85.5
3	78.5	88.5
5	82.5	88.5
7.5	84.0	90.0
10	85.5	90.0
20	87.5	92.0

2.22.2 Motor Controls and Motor Control Centers

NEMA ICS 1, NEMA ICS 2, NEMA ICS 3 and NEMA ICS 6, and UL 508 and UL 845.

2.23 PANELBOARDS

Dead-front construction, NEMA PB 1 and UL 67

2.24 RECEPTACLES

2.24.1 Ground Fault Interrupters

UL 943, Class A.

2.25 SERVICE EQUIPMENT

UL 869A

2.26 SPLICE, CONDUCTOR

UL 486C

2.27 SNAP SWITCHES

UL 20

2.28 TAPES

2.28.1 Plastic Tape

UL 510

2.28.2 Rubber Tape

UL 510

2.29 TRANSFORMERS

2.29.1 Conventional Dry-Type

UL 1561 in addition to the specific standards referenced below.

- a. General Purpose: Ventilated, 15 to 500 kVA, three-phase with high-voltage and low-voltage 120-600 volts.

2.30 WIRING DEVICES

NEMA WD 1 for general-purpose wiring devices, and NEMA WD 6 for dimensional requirements of wiring devices.

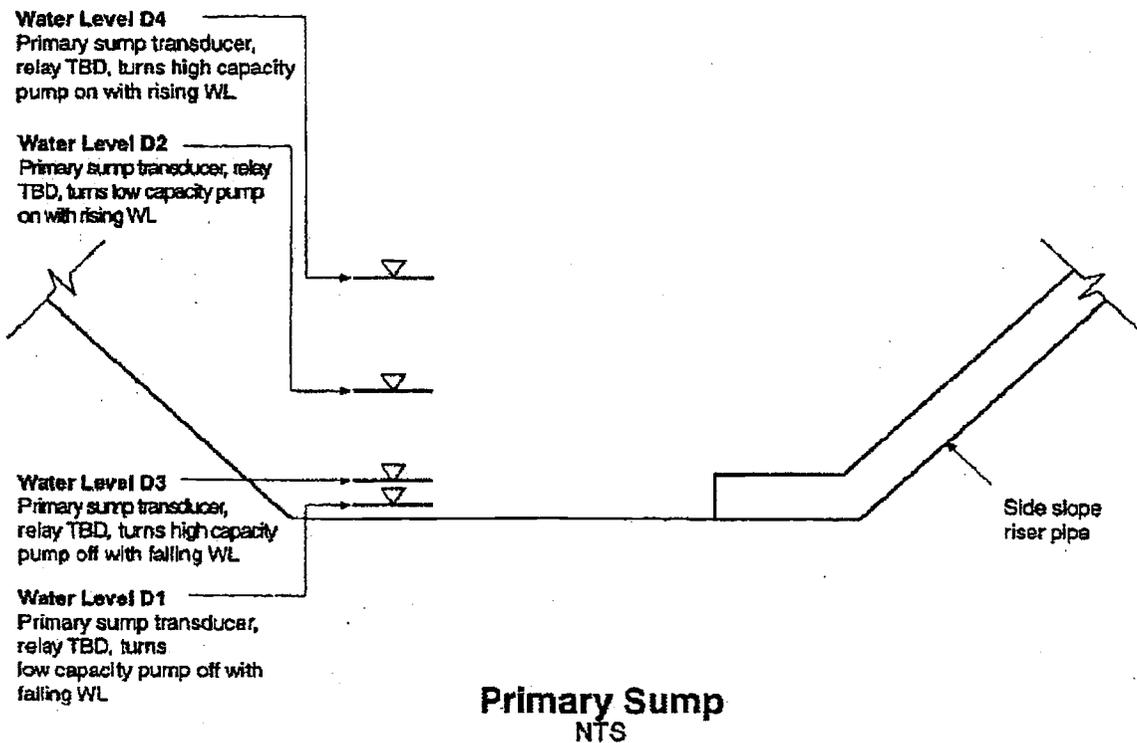
2.31 LEVEL MEASUREMENT

2.31.1 Submersible Transducer for Sumps

System shall use a submersible transducer with a pressure sensing range suitable for a depth application of 1 to 10 feet. Transducer shall provide a 4-20 ma output to a digital monitor/controller for level monitoring and control with 2 adjustable setpoint relay outputs. Transducer shall be provided with a cable of unspliced length sufficient to route to the monitor/controller. Monitor/controller shall provide two relay outputs.

Transducer shall be 612 Series submersible liquid level transmitter and transducer as manufactured by NOSHOK or as approved.

Pump ID	Description	Function	Water Level	Level Above Sump Floor
Pump-1	Primary Sump High Capacity Pump	Pump Start	D4	2 feet
Pump-1	Primary Sump High Capacity Pump	Pump Stop	D3	1.2 feet
Pump-2	Primary Sump Low Capacity Pump	Pump Start	D2	1.3 feet
Pump-2	Primary Sump Low Capacity Pump	Pump Stop	D1	0.8 feet
Pump-3	Secondary Sump Low Capacity Pump	Pump Start	D2	1.3 feet
Pump-3	Secondary Sump Low Capacity Pump	Pump Stop	D1	0.8 feet



2.32 DATA LOGGER (N/A)

2.33 PROGRAMMABLE LOGIC CONTROLLER (PLC)

A programmable logic controller (PLC) system shall be used to monitor and control of the leachate system. The PLC system shall match, and additional components be similar to, the Allen-Bradley SLC 500 modular system installed in the Cells 7 and 8 crest pad buildings. The following SLC 500 modular components were installed in Cells 7 and 8.

- A-B 1747-L531, 5/03 Modular Processor, 8k memory
- A-B 1746-P2, Power Supply
- A-B 1746-A7, 7 Slot Chassis
- A-B 1746-IA8, 120V AC Input Module
- A-B 1746-OX8, Relay Output Module
- A-B 1746-NI4, 4-20mA Input Module
- RSLogix500 PLC Program

The control logic for the PLC shall match the control logic used for Cells 7 and 8. A copy of the control logic is in Attachment A.

2.34 TELEMETRY CONTROL SYSTEM

A wireless telemetry control system shall be used to transmit data between the crest pad buildings and the master telemetry panel/SCADA computer in Building No. MO-481 at ERDF. A radio, antenna, telemetry panel, and associated appurtances shall be installed in each crest pad building and shall match, unless approved otherwise by the CONTRACTOR, the system installed in ERDF Cells 7 and 8 and as specified on the Drawings.

3.0 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Equipment and devices shall be installed and energized in accordance with the manufacturer's published instructions. Steel conduits installed underground shall be installed and protected from corrosion in conformance with the requirements for conduit systems Below Slab-on-Grade or In the Ground of this specification. Except as covered herein, excavation, trenching, and backfilling shall conform to the requirements of the Technical Specification for Site Work.

3.1.1 Conformance to Codes

The installation shall comply with the requirements and recommendations of NFPA 70, NFPA 70E, NFPA 101, IEEE C2, OSHA 29CFR1910 and DOE-STD-1066-99 as applicable.

3.1.2 Verification of Work, Dimensions, and Construction Sequencing

The SUBCONTRACTOR shall become familiar with details of the work, shall verify dimensions in the field, and shall advise the CONTRACTOR of any discrepancy before performing any work. The SUBCONTRACTOR shall carefully examine all work to be done in, on, or adjacent to existing equipment. Work shall be scheduled, subject to the CONTRACTOR's approval, to avoid plant shutdown, all switching, safety tagging, etc. required to isolate existing equipment shall be performed by the SUBCONTRACTOR. In no case shall the SUBCONTRACTOR begin any work in, on, or adjacent to existing equipment without written authorization by the CONTRACTOR. The SUBCONTRACTOR shall make modifications or alterations to existing electrical facilities required to successfully install and integrate the new electrical equipment as indicated. All modifications to existing equipment, panels, or cabinets shall be made in a professional manner with coatings repaired to match existing. The costs for modifications to existing electrical facilities required for a complete and operating system shall be included in the SUBCONTRACTOR's original bid amount and no additional payment for this work shall be authorized. The SUBCONTRACTOR shall be responsible for identifying available existing circuit breakers in lighting panels for the intended use as required by the drawings. Lighting fixtures, outlets, and other equipment and materials shall be located to avoid interference with mechanical or structural features; otherwise, lighting fixtures shall be symmetrically located according to the room arrangement when uniform illumination is required, or asymmetrically located to suit conditions fixed by design as shown. Raceways, junction and outlet boxes, and lighting fixtures shall not be supported from sheet metal roof decks. If any conflicts occur necessitating departures from the drawings, details of and reasons for departures shall be submitted and approved prior to implementing any change. The SUBCONTRACTOR shall coordinate the electrical work with the drawings and provide all power related wiring even if not shown on the electrical drawings.

SUBCONTRACTOR will be responsible for field verifying the available space in substation switchboards to integrate new power circuit breakers. Costs for this work shall be included in the SUBCONTRACTOR's original bid amount. To facilitate continuous operation of existing equipment, the SUBCONTRACTOR will be required to provide temporary equipment as required to maintain the existing facility operation. All costs associated with these temporary installations shall be part of the original bid.

3.2 CABLE INSTALLATION

The SUBCONTRACTOR shall obtain from the manufacturer an installation manual or set of instructions which addresses such aspects as cable construction, insulation type, cable diameter, bending radius, cable temperature, lubricants, coefficient of friction, conduit cleaning, storage procedures, moisture seals, testing for and purging moisture, etc. The SUBCONTRACTOR shall then perform pulling calculations and prepare a pulling plan that will be followed during cable installation.

3.2.1 Cable Installation Plan and Procedure

Cable shall be installed strictly in accordance with the cable manufacturer's recommendations. Each circuit shall be identified by means of fiber, laminated plastic or non-ferrous metal tags, in each pullbox and each terminal. Identification shall match wire and cable numbers as shown on the as-built drawings. Wire and cables not numbered on drawings shall be labeled as directed by the CONTRACTOR.

3.2.1.1 Cable Inspection. The cable reel shall be inspected for correct storage positions, signs of physical damage, and broken end seals. If end seal is broken, moisture shall be removed from cable in accordance with the cable manufacturer's recommendations.

3.2.1.2 Duct Cleaning. Duct shall be cleaned with an assembly that consists of a flexible mandrel (manufacturers standard product in lengths recommended for the specific size and type of duct) that is 1/4 inch less than inside diameter of duct, 2 wire brushes, and a rag. The cleaning assembly shall be pulled through conduit a minimum of 2 times or until less than a volume of 8 cubic inches of debris is expelled from the duct.

3.2.1.3 Duct Lubrication. The cable lubricant shall be compatible with the cable jacket for cable that is being installed. Application of lubricant shall be in accordance with lubricant manufacture's recommendations.

3.2.1.4 Cable Installation. The SUBCONTRACTOR shall provide a cable feeding truck and a cable pulling winch, or other equipment approved by the CONTRACTOR. The SUBCONTRACTOR shall provide a pulling grip or pulling eye in accordance with cable manufacturer's recommendations. The pulling grip or pulling eye apparatus shall be attached to polypropylene or manila rope followed by lubricant front end packs and then by power cables. A dynamometer shall be used to monitor pulling tension. Pulling tension shall not exceed cable manufacturer's recommendations. The SUBCONTRACTOR shall not allow cables to cross over while cables are being fed into duct. For cable installation in cold weather, cables shall be kept at 50 degrees F temperature for at least 24 hours before installation.

3.2.1.5 Cable Installation Plan. Cable installation plan shall include:

- a. Site layout drawing with cable pulls identified in numeric order of expected pulling sequence and direction of cable pull.
- b. List of cable installation equipment.
- c. Lubricant manufacturer's application instructions.
- d. Procedure for resealing cable ends to prevent moisture from entering cable.
- e. Cable pulling tension calculations of all cable pulls.

- f. Cable percentage conduit fill.
- g. Cable sidewall thrust pressure.
- h. Cable minimum bend radius and minimum diameter of pulling wheels used.
- i. Cable jam ratio.
- j. Maximum allowable pulling tension on each different type and size of conductor.
- k. Maximum allowable pulling tension on pulling device.

3.2.2 Duct Line

Cables shall be installed in duct lines where indicated. Cable splices in low-voltage cables shall be made in manholes and handholes only, except as otherwise noted. Neutral and grounding conductors shall be installed in the same duct with their associated phase conductors.

3.2.3 Electric Pullboxes

Cables shall be routed around the interior walls and securely supported from walls on cables racks. Cable routing shall minimize cable crossover, provide access space for maintenance and installation of additional cables, and maintain cable separation.

3.3 DUCT LINES

3.3.1 Requirements

Numbers and sizes of ducts shall be as indicated. Duct lines shall be laid with a minimum slope of 4 inches per 100 feet. Depending on the contour of the finished grade, the high-point may be at a terminal, a pullbox, or between pullboxes. Short-radius manufactured 90-degree duct bends may be used only for pole or equipment risers, unless specifically indicated as not acceptable. The minimum manufactured bend radius shall be 18 inches for ducts of less than 3 inches in diameter, and 36 inches for ducts 3 inches or greater in diameter. Otherwise, long sweep bends having a minimum radius of 25 feet shall be used for a change of direction of more than 5 degrees, either horizontally or vertically. Both curved and straight sections may be used to form long sweep bends, but the maximum curve used shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells whenever duct lines terminate in pullboxes.

3.3.2 Treatment

Ducts shall be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration

with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.

3.3.3 Concrete Encasement

Duct line encasements shall be monolithic construction. Where a connection is made to a previously poured encasement or pullbox, the new encasement shall be well bonded or doweled to the existing encasement. At any point tops of concrete encasements shall be not less than the cover requirements listed in NFPA 70. As shown duct lines shall be encased with concrete and reinforced as indicated to withstand specified surface loading. Separators or spacing blocks shall be made of concrete, plastic, or a combination of these materials placed not farther apart than 4 feet on centers. Ducts shall be securely anchored to prevent movement during the placement of concrete and joints shall be staggered at least 6 inches vertically. Ferrous materials or rebars shall not be used for securing and completely encircling a single duct.

3.3.4 Nonencased Direct-Burial

Top of duct lines shall be less than 30 inches below finished grade and shall be installed with a minimum of 3 inches of earth around each duct, except that between adjacent electric power and communication ducts, 12 inches of earth is required. Bottoms of trenches shall be graded toward pullboxes and shall be smooth and free of stones, soft spots, and sharp objects. Where bottoms of trenches comprise materials other than sand, a 3 inch layer of sand shall be laid first and compacted to approximate densities of surrounding firm soil before installing ducts. The rest of the excavation shall be backfilled and compacted in 3 to 6 inch layers. Ferrous materials or rebars shall not be used for securing and completely encircling a single duct.

3.3.5 Installation of Couplings

Joints in each type of duct shall be made up in accordance with the manufacturer's recommendations for the particular type of duct and coupling selected and as approved.

3.3.5.1 Plastic Duct. Duct joints shall be made by brushing a plastic solvent cement on insides of plastic coupling fittings and on outsides of duct ends. Each duct and fitting shall then be slipped together with a quick 1/4-turn twist to set the joint tightly.

3.3.6 Duct Line Markers

A 5mil brightly colored plastic tape, not less than 3 inches in width and suitably inscribed at not more than 10 feet on centers with a continuous metallic backing and a corrosion-resistant 1 mil metallic foil core to permit location of the duct line, shall be placed approximately 12 inches below finished grade levels.

3.4 PULLBOXES

3.4.1 General

Pullboxes shall be constructed approximately where shown. The exact location of each pullbox shall be determined after careful consideration has been given to the location of other utilities and grading. The location of each pullbox shall be approved by the CONTRACTOR before construction of the pullbox is started. In unpaved areas, the top of manhole covers shall be approximately 1/2 inch above the finished grade. Where existing grades that are higher than finished grades are encountered, concrete assemblies designed for the purpose shall be installed to elevate temporarily the manhole cover to existing grade level. Where duct lines enter manholes, the sections of duct may be either cast in the concrete or may enter the manhole through a square or rectangular opening of suitable dimensions provided in the manhole walls. Where openings are provided for the entrance of duct lines, the space between ducts and between ducts and manhole walls shall be caulked tight with lead wool or approved equal. A cast metal grille-type sump frame and cover shall be installed over the manhole sump. A cable-pulling iron shall be installed in the wall opposite each duct line entrance.

3.4.2 Electric Pullboxes

Cables shall be securely supported from walls by hot-dip galvanized cable racks and equipped with adjustable hooks and insulators. Cable racks shall be installed in each manhole and not less than 2 spare hooks shall be installed on each cable rack. Insulators shall be made of high-glazed porcelain. Insulators will not be required on spare hooks. Covers shall be marked "Low Voltage" and provided with 2 lifting eyes and 2 hold-down bolts. Each box shall have a suitable opening for a ground rod. Conduit, cable, ground rod entrances, and unused openings shall be sealed with mortar.

3.4.3 Signal Pullboxes

The number of hot-dip galvanized cable racks indicated shall be installed in each Signal Pullbox. Each cable rack shall be provided with 2 cable hooks. Cables for the telephone and communication systems will be installed by others. Each box shall have a suitable opening for a ground rod.

3.4.4 Ground Rods

A ground rod shall be installed at the pullboxes. When precast concrete manholes are used, the top of the ground rod may be below the manhole floor and a No. 1/0 AWG tinned ground conductor brought into the manhole through a watertight sleeve in the manhole wall.

3.5 PAD-MOUNTED EQUIPMENT INSTALLATION

Pad-mounted equipment, shall be installed on concrete pads in accordance with the manufacturers published, standard installation drawings and procedures, except that they shall be

modified to meet the requirements of this document. Units shall be carefully installed so as not to damage equipment or scratch painted or coated surfaces. After installation, surfaces shall be inspected and scratches touched up with a paint or coating provided by the manufacturer especially for this purpose.

3.5.1 Concrete Pads

3.5.1.1 Construction. Concrete pads for pad-mounted electrical equipment shall be poured-in-place. Pads shall be constructed as indicated except that exact pad dimensions and mounting details are equipment specific and are the responsibility of the SUBCONTRACTOR. Tops of concrete pads shall be level and shall project 100 mm (4 in.) above finished paving or grade and sloped to drain. Edges of concrete pads shall have 20 mm (3/4 in.) chamfer. Conduits for primary, secondary, and grounding conductors shall be set in place prior to placement of concrete pads. Where grounding electrode conductors are installed through concrete pads, PVC conduit sleeves shall be installed through the concrete to provide physical protection.

3.5.1.2 Conduit and Enclosure Sealing. When the installation is complete, the SUBCONTRACTOR shall seal all conduit and other entries into equipment enclosures, handholes, and manholes with an approved sealing compound. Seals shall be of sufficient strength and durability to protect energized live parts of the equipment from rodents, insects, or other foreign matter.

3.6 CONNECTIONS TO BUILDINGS

Cables shall be extended into the various buildings as indicated, and shall be connected to the first applicable termination point in each building. Interfacing with building interior conduit systems shall be at conduit stubouts terminating 5 feet outside of a building and 2 feet below finished grade. After installation of cables, conduits shall be sealed with caulking compound to prevent entrance of moisture or gases into buildings.

3.7 GROUNDING (UTILITY SIDE)

A ground ring consisting of the indicated configuration of bare copper conductors and driven ground rods shall be installed around pad-mounted equipment as shown. Equipment frames of metal-enclosed equipment, and other noncurrent-carrying metal parts, such as cable shields, cable sheaths and armor, and metallic conduit shall be grounded. At least 2 connections shall be provided from a transformer and a motor control center to the ground ring.

3.7.1 Grounding Electrodes

Grounding electrodes shall be installed as shown on the drawings and as follows:

- a. Driven rod electrodes - Unless otherwise indicated, ground rods shall be driven into the earth until the tops of the rods are approximately 1 foot below finished grade.

- b. Ground ring - A ground ring shall be installed as shown consisting of bare copper conductors installed 18 inches, plus or minus 3 inches, below finished top of soil grade. Ground ring conductors shall be sized as shown.
- c. Additional electrodes - Whenever the required ground resistance is not met, provide additional electrodes interconnected with grounding conductors, to achieve the specified ground resistance. The additional electrodes will be three, 8 foot rods spaced a minimum of 6 feet apart.

Each utility grounding system will be kept 20 feet from the site service grounding system.

3.7.2 Grounding and Bonding Connections

Connections above grade shall be made by the fusion-welding process or with bolted solderless connectors, in compliance with UL 467, and those below grade shall be made by a fusion-welding process. Where grounding conductors are connected to aluminum-composition conductors, specially treated or lined copper-to-aluminum connectors suitable for this purpose shall be used.

3.7.3 Grounding and Bonding Conductors

Grounding and bonding conductors include all conductors used to bond transformer enclosures and equipment frames to the grounding electrode system. Grounding and bonding conductors shall be sized as shown, and located to provide maximum physical protection. Bends greater than 45 degrees in ground conductors are not permitted. Routing of ground conductors through concrete shall be avoided. When concrete penetration is necessary, nonmetallic conduit shall be cast flush with the points of concrete entrance and exit so as to provide an opening for the ground conductor and the opening shall be sealed with a suitable compound after installation.

3.7.4 Pullbox Grounding

Ground rods installed in electrical-distribution-system pullboxes shall be connected to cable racks, cable-pulling irons, the cable shielding, metallic sheath, and armor at each cable joint or splice by means of a No. 4 AWG braided tinned copper wire. Connections to metallic cable sheaths shall be by means of tinned terminals soldered to ground wires and to cable sheaths. Care shall be taken in soldering not to damage metallic cable sheaths or shields. Ground rods shall be protected with a double wrapping of pressure-sensitive plastic tape for a distance of 2 inches above and 6 inches below concrete penetrations. Grounding electrode conductors shall be neatly and firmly attached to pullbox walls and the amount of exposed bare wire shall be held to a minimum.

3.8 UNIT HEATERS AND EXHAUST FANS

Unit heaters and exhaust fans shall be installed at the locations shown and in accordance with the recommendations of the manufacturer. All hardware necessary for installation shall be provided and sufficiently anchored to meet seismic loading requirements of UBC zone 2B.

3.9 GROUNDING (SERVICE SIDE)

Grounding shall be in conformance with NFPA 70, the Subcontract drawings, and the following specifications.

3.9.1 Ground Bus

Ground bus shall be provided in the electrical equipment rooms. Non-current-carrying metal parts, transformer neutrals and other electrical equipment shall be effectively grounded by bonding to the bus. The ground bus shall be bonded to both the entrance ground, and to a ground rod or rods. Connections and splices shall be of the brazed, welded, bolted, or pressure-connector type, except that pressure connectors or bolted connections shall be used for connections to removable equipment.

3.9.2 Grounding Conductors

All equipment grounding conductors shall be bonded or joined together in each wiring box or equipment enclosure. Metallic boxes and enclosures, if used, shall also be bonded to these grounding conductors by an approved means per NFPA 70. When boxes for receptacles, switches, or other utilization devices are installed, any designated grounding terminal on these devices shall also be bonded to the equipment grounding conductor junction with a short jumper.

3.10 WIRING METHODS

3.10.1 General Requirements

Unless otherwise indicated, wiring shall consist of insulated conductors installed in rigid zinc-coated steel conduit or rigid plastic conduit.

3.10.2 Conduit Systems

Conduit systems shall be installed as indicated. Only metal conduits will be permitted when conduits are required for shielding or other special purposes indicated, or when required by conformance to NFPA 70. Nonmetallic conduit may be used in damp, wet or corrosive locations when permitted by NFPA 70 and the conduit system is provided with appropriate boxes, covers, clamps, screws or other appropriate type of fittings. Electrical metallic tubing may be installed only within buildings. Bushings, manufactured fittings or boxes providing equivalent means of protection shall be installed on the ends of conduits and shall be of the insulating type, where required by NFPA 70.

3.10.2.1 Below Slab-on-Grade or In the Ground. All electrical wiring below slab-on-grade shall be protected by a conduit system. Conduit passing vertically through slabs-on-grade shall be rigid steel. Rigid steel conduits installed below slab-on-grade or in the earth shall be field wrapped with 0.010 inch thick pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory-applied polyvinyl chloride, plastic resin, or epoxy coating system.

3.10.2.2 Changes in Direction of Runs. Changes in direction of runs shall be made with symmetrical bends or cast-metal fittings. Field-made bends and offsets shall be made with an approved hickey or conduit-bending machine. Care shall be taken to prevent the lodgment of dirt or trash in boxes, fittings and equipment during the course of construction.

3.10.2.3 Supports. Metallic conduits shall be securely and rigidly fastened in place at intervals of not more than 10 feet and within 3 feet of boxes, cabinets, and fittings, with approved pipe straps, wall brackets, conduit clamps, conduit hangers, threaded C-clamps, or ceiling trapeze. C-clamps or beam clamps shall have strap or rod-type retainers. Rigid plastic conduits (if permitted as a wiring method) shall be supported as indicated above, except that they will be supported at intervals as indicated in NFPA 70. Loads and supports shall be coordinated with supporting structure to prevent damage or deformation to the structures, but no load shall be applied to joist bridging. Fastenings shall be by expansion bolts on concrete; by machine screws, welded threaded studs, heat-treated or spring-steel-tension clamps on steelwork. Nail-type nylon anchors or threaded studs driven in by a powder charge and provided with lock washers and nuts may be used in lieu of expansion bolts or machine screws. Pipe straps shall not be welded to steel structures. In partitions of light steel construction, sheet-metal screws may be used. Conduit shall not be supported using wire or nylon ties. Conduits shall be fastened to sheet-metal boxes and cabinets with two locknuts where required by NFPA 70, where insulating bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, a single locknut and bushing may be used. Threadless fittings for electrical metallic tubing shall be of a type approved for the conditions encountered.

3.10.3 Cables and Conductors

Wire connectors of insulating material or solderless pressure connectors properly taped shall be utilized for splices.

3.10.3.1 Power Conductor Identification. Color-coding shall identify phase conductors. The color of the insulation on phases A, B, and C respectively (for three phase) or phases A and B respectively (for single phase) of different voltage systems shall be as follows:

- a. 120/208 volt, 3-phase: Black, red, and blue; white neutral, green or bare ground.
- b. 277/480 volt, 3-phase: Brown, orange, and yellow; gray neutral, green or bare ground.
- c. 120/240 volt, single/phase: Black and red; white neutral, green or bare ground.

Conductor phase and voltage identification shall be made by color-coded insulation for conductors smaller than No. 6 AWG. For conductors No. 6 AWG and larger, identification shall be made by color-coded insulation, or conductors with black insulation may be furnished and identified by the use of half-lapped bands of colored electrical tape wrapped around the insulation for a minimum of 3 inch of length near the end, or other method as submitted by the SUBCONTRACTOR and approved by the CONTRACTOR. Conductor identification shall be provided within each enclosure where a tap, splice, or termination is made. Phase identification by a particular color shall be maintained continuously for the length of a circuit, including junctions.

3.10.3.2 Control Conductor Identification. Control circuit conductor identification shall be made by color-coded insulated conductors, plastic-coated self-sticking printed markers, permanently attached stamped metal foil markers, or equivalent means as approved. All control circuit terminals of equipment shall be properly identified with terminal and conductor identification matching that shown on drawings. When conductor identification is not shown, SUBCONTRACTOR shall provide identification list to the CONTRACTOR for approval. Hand lettering or marking is not acceptable.

3.11 BOXES AND SUPPORTS

Boxes shall be provided in the wiring systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes shall be sheet steel except that aluminum boxes may be used with aluminum conduit, and nonmetallic boxes may be used with nonmetallic conduit and tubing or nonmetallic sheathed cable system, when permitted by NFPA 70. In partitions of light steel construction bar hangers with 1 inch long studs, mounted between metal wall studs or metal stud "C" brackets snapped on and tab-locked to metal wall studs, shall be used to secure boxes to the building structure. When "C" brackets are used, additional box support shall be provided on the side of the box opposite the brackets. The edges of boxes for electrical devices shall be flush with the finished surfaces in plywood installations. Boxes for mounting lighting fixtures shall be not less than 4 inches square. Boxes installed for concealed wiring shall be provided with suitable extension rings or plaster covers, as required. Unless otherwise indicated, boxes for wall switches shall be mounted 46 inches above finished floors. Cast-metal boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces shall be gasketed. Boxes and supports shall be fastened with machine screws or welded studs on steelwork. Threaded studs driven in by powder charge and provided with lock washers and nuts, or nail-type nylon anchors may be used in lieu of machine screws. In open overhead spaces, cast-metal boxes having threadless connectors and sheet metal boxes shall be supported directly from the building structure or by bar hangers. Hangers shall not be fastened to or supported from joist bridging. Cast-metal boxes with 3/32 inch wall thickness are acceptable.

3.11.1 Pull Boxes

Pull boxes of not less than the minimum size required by NFPA 70 shall be constructed of aluminum or galvanized sheet steel, except where cast-metal boxes are required in locations

specified above. Boxes shall be furnished with screw-fastened covers. Where several feeders pass through a common pull box, the feeders shall be tagged to indicate clearly the electrical characteristics, circuit number, and panel designation.

3.11.2 Conduit Stub-Ups

Conduits stubbed up through concrete floors for connections to freestanding equipment shall be provided with a short elbow and an adjustable top or coupling threaded inside for plugs, set flush with the finished floor. Wiring shall be extended in rigid threaded conduit to equipment, except that where required, flexible conduit may be used 6 inches above the floor. Screwdriver operated threaded flush plugs shall be installed in conduits from which no equipment connections are made to suit the devices installed.

3.12 DEVICE PLATES

One-piece type device plates shall be provided for outlets and fittings. Plates on walls and on fittings shall be of zinc-coated sheet steel, cast-metal, or impact resistant plastic having rounded or beveled edges. Screws shall be of metal with countersunk heads, in a color to match the finish of the plate.

Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plates shall be installed with an alignment tolerance of 1/16 inches. The use of sectional-type device plates will not be permitted. Plates installed in wet locations shall be gasketed and provided with a hinged, gasketed cover, unless otherwise specified.

3.13 RECEPTACLES

3.13.1 Duplex

Duplex receptacles shall be rated 20 amperes, 125 volts, two-pole, three-wire, grounding type with polarized parallel slots. Contact arrangement shall be such that contact is made on two sides of an inserted blade. Receptacle shall be side- or back-wired with two screws per terminal. The third grounding pole shall be connected to the metal mounting yoke.

3.13.2 Weatherproof

Weatherproof receptacles shown shall be mounted in a box with a gasketed weatherproof, cast-metal cover plate and gasketed cap over each receptacle opening. The receptacle shall be weatherproof with plug inserted.

3.14 WALL SWITCHES

Wall switches shall be of the totally enclosed tumbler type. The wall switch handle and switch plate color shall harmonize with the color of the respective wall. Wiring terminals shall be of the

screw type or of the solderless pressure type having suitable conductor-release arrangement. Not more than two switches shall be installed in a single-gang position. Switches shall be rated 20-ampere 120-volt for use on alternating current only.

3.15 SERVICE EQUIPMENT

Service-disconnecting means shall be of the fusible safety switch type as indicated with external handle for manual operation. When service-disconnecting means is a part of an assembly, the assembly shall be listed as suitable for service entrance equipment. Enclosures shall be sheet metal with hinged cover for surface mounting unless otherwise indicated.

3.16 PANELBOARDS AND LOADCENTERS

Circuit breakers and switches used as a motor disconnecting means, and not in sight of the motor and the driven machinery location, shall be capable of being locked in the open position. Door locks shall be keyed alike. Nameplates shall be as approved. Directories shall be typed to indicate loads served by each circuit and mounted in a holder behind a clear protective covering. Busses shall be copper.

3.16.1 Loadcenters

Loadcenters shall be circuit breaker equipped.

3.16.2 Panelboards

Panelboards shall be circuit breaker equipped as indicated on the drawings.

3.17 FUSES

Equipment provided under this Subcontract shall be provided with a complete set of properly rated fuses when the equipment manufacturer utilize fuses in the manufacture of the equipment, or if current-limiting fuses are required to be installed to limit the ampere-interrupting capacity of circuit breakers or equipment to less than the maximum available fault current at the location of the equipment to be installed. Fuses shall have a voltage rating of not less than the phase-to-phase circuit voltage, and shall have the time-current characteristics required for effective power system coordination.

3.18 UNDERGROUND SERVICE CONDUITS

Empty conduits for underground electric-service cable and signal cable shall be installed as indicated. Except where otherwise indicated, conduits shall terminate approximately 5 feet beyond the building wall and 2 feet below finished grade, with the outside ends bushed and plugged or capped.

3.19 MOTORS

Fractional and Integral Kilowatt, (Horsepower), whether or not motors are separately provided or included in equipment assemblies specified in other sections of these specifications. Each motor shall conform to the kW (hp) and voltage ratings indicated, and shall have a service factor and other characteristics that are essential to the proper application and performance of the motors under conditions shown or specified. Three-phase motors for use on 3-phase 480-volt systems shall have a nameplate rating of 460 volts. Unless otherwise specified, motors shall have open frames, and continuous-duty classification based on a 40 degree C ambient temperature reference. Polyphase motors shall be squirrel-cage type, having normal-starting-torque and low-starting-current characteristics, unless other characteristics are specified in other sections of these specifications or shown on Subcontract drawings. When electrically driven equipment furnished under other sections of these specifications materially differs from the design, the SUBCONTRACTOR shall make the necessary adjustments to the wiring, disconnect devices and branch-circuit protection to accommodate the equipment actually installed.

3.20 MOTOR CONTROL

Each motor or group of motors requiring a single control and not controlled from a motor-control center shall be provided under other sections of these specifications with a suitable controller and devices that will perform the functions as specified for the respective motors. Each motor of 93 W (1/8 hp) or larger shall be provided with thermal-overload protection. Polyphase motors shall have overload protection in each ungrounded conductor. The overload-protection device shall be provided either integral with the motor or controller, or shall be mounted in a separate enclosure. Unless otherwise specified, the protective device shall be of the manually reset type. Single or double pole tumbler switches specifically designed for alternating-current operation only may be used as manual controllers for single-phase motors having a current rating not in excess of 80 percent of the switch rating. Automatic control devices such as thermostats, float or pressure switches may control the starting and stopping of motors directly, provided the devices used are designed for that purpose and have an adequate kilowatt (horsepower) rating. When the automatic-control device does not have such a rating, a magnetic starter shall be used, with the automatic-control device actuating the pilot-control circuit. When combination manual and automatic control is specified and the automatic-control device operates the motor directly, a double-throw, three-position tumbler or rotary switch shall be provided for the manual control: when the automatic-control device actuates the pilot control circuit of a magnetic starter, the latter shall be provided with a three-position selector switch marked MANUAL-OFF-AUTOMATIC. Connections to the selector switch shall be such that only the normal automatic regulatory control devices will be bypassed when the switch is in the Manual position; all safety control devices, such as low- or high-pressure cutouts, high-temperature cutouts, and motor-overload protective devices, shall be connected in the motor-control circuit in both the Manual and the Automatic positions of the selector switch. Control circuit connections to any MANUAL-OFF-AUTOMATIC switch or to more than one automatic regulatory control device shall be made in accordance with wiring diagram approved by the CONTRACTOR unless such diagram is included on the drawings. All controls shall be 120 volts or less unless otherwise indicated.

3.20.1 Motor Control Centers

Control centers shall be indoor type and shall contain combination starters and other equipment as indicated. Control centers shall be NEMA ICS 2, Class 1, Type 2. Each control center shall be mounted on floor sills or mounting channels. Each circuit shall have a suitable metal or laminated plastic nameplate with white cut letters. Combination starters shall be provided with circuit breakers. Motor control centers shall be provided with a full-length ground bus bar.

3.20.2 Contacts

Contacts in miscellaneous control devices such as float switches, pressure switches, and auxiliary relays shall have current and voltage ratings in accordance with NEMA ICS 2 for rating designation B300.

3.21 MOTOR-DISCONNECT MEANS

Each motor shall be provided with a disconnecting means when required by NFPA 70 even though not indicated. For single-phase motors, a single or double pole toggle switch, rated only for alternating current, will be acceptable for capacities less than 30 amperes, provided the ampere rating of the switch is at least 125 percent of the motor rating. Switches shall disconnect all ungrounded conductors.

3.22 TRANSFORMERS

Only transformers having two windings per phase will be approved. Three-phase transformers shall be connected only in a delta-wye. The insulation on transformer windings may be the manufacturer's standard for transformers rated for operation in a 104 degrees F ambient temperature. Single kVA ratings shown are based on self-cooled operation. The basic impulse level (BIL) of individual transformers shall be as stated in the following paragraphs. The conventional dry-type transformer shown located within 5 feet of the exterior wall shall be provided in a weatherproof enclosure. The average sound level in decibels (dB) of transformers shall not exceed the 50 dB level.

3.22.1 Conventional Dry-Type Transformers

Transformers having the primary or higher-voltage winding rated at 600 volts or less and a secondary or lower-voltage winding rated at 240 volts or less may be manufacturer's standard ventilated or enclosed, self-cooled type of transformer unless otherwise shown, specified or required for proper and safe application.

3.23 LAMPS AND LUMINAIRES

3.23.1 Lamps

Lamps of the type, wattage, and voltage rating indicated shall be delivered to the project in the original cartons and installed in the luminaires just prior to the completion of the project.

3.23.2 Accessories

Accessories such as straps, mounting plates, nipples, or brackets shall be provided for proper installation. Open type fluorescent luminaires with exposed lamps shall have a wire-basket type guard,

3.24 EQUIPMENT CONNECTIONS

All wiring not furnished and installed under other sections of the specifications for the connection of electrical equipment as indicated on the drawings shall be furnished and installed under this section of the specifications. Connections shall comply with the applicable requirements of paragraph WIRING METHODS. Flexible conduit 6 feet or less in length shall be provided to electrical equipment subject to periodic removal, vibration, or movement and for all motors. All motors shall be provided with separate grounding conductors. Liquid-tight conduits shall be used in damp or wet locations.

3.24.1 Motors and Motor Control

Control equipment shall be connected under this section of the specifications unless shown or specified otherwise.

3.25 SEISMIC SUPPORTS

Electrical equipment shall be installed with supports capable of withstanding a seismic 2B event as defined by the UBC.

3.26 PAINTING AND FINISHING

Field-applied paint on exposed surfaces shall be provided under the Technical Specification for Coatings and Finishes.

3.27 REPAIR OF EXISTING WORK

The work shall be carefully laid out in advance, and where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceiling, or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, or other electrical work, this work shall be carefully done, and any damage to building, piping, or equipment shall be repaired by skilled mechanics of the trades involved, at no additional cost to the CONTRACTOR.

3.28 IDENTIFICATION NAMEPLATES

Major items of electrical equipment and major components shall be permanently marked with an identification name to identify the equipment by type or function and specific unit number as indicated. Designation of motors shall coincide with their designation in the motor control center or panel. Unless otherwise specified, identification nameplates shall be made of laminated plastic in accordance with FS L-P-387 with black outer layers and a white core. Edges shall be chamfered. Plates shall be fastened with black-finished round-head drive screws, except motors, or approved nonadhesive metal fasteners. When the nameplate is to be installed on an irregular-shaped object, the SUBCONTRACTOR shall devise an approved support suitable for the application and ensure the proper installation of the supports and nameplates. In all instances, the nameplate shall be installed in a conspicuous location. At the option of the CONTRACTOR, the equipment manufacturer's standard embossed nameplate material with black paint-filled letters may be furnished in lieu of laminated plastic. The front of each panelboard and motor control center shall have a nameplate to indicate the phase letter, corresponding color and arrangement of the phase conductors. The following equipment, as a minimum, shall be provided with identification nameplates:

Minimum 1/4 inch High Letters

Panelboards

Starters

Safety Switches

Motor Control Centers

Transformers

Equipment Enclosures (Including Vaults)

Motors

Minimum 1/8 inch High Letters

Control Power Transformers

Control Devices

Unit Heaters

Each panel, section, or unit in motor control centers or similar assemblies shall be provided with a nameplate in addition to nameplates listed above, which shall be provided for individual compartments in the respective assembly, including nameplates which identify "future," "spare," and "dedicated" or "equipped spaces."

3.29 FIELD TESTING

3.29.1 General

Field testing shall be performed in the presence of the CONTRACTOR. The SUBCONTRACTOR shall notify the CONTRACTOR 10 days prior to conducting tests. No part of the electrical distribution system shall be energized prior to the resistance testing of that system's ground rods and submission of test results to the CONTRACTOR. The SUBCONTRACTOR shall furnish materials, labor, and equipment necessary to conduct field tests, and the CONTRACTOR will furnish the necessary electrical power. The SUBCONTRACTOR shall perform all tests and inspections recommended by the manufacturer unless specifically waived by the CONTRACTOR. The SUBCONTRACTOR shall maintain a

written record of tests which includes date, test performed, personnel involved, devices tested, serial number and name of test equipment, and test results. All field test reports shall be signed and dated by the SUBCONTRACTOR. The SUBCONTRACTOR shall replace any devices or equipment which are damaged due to improper test procedures or handling.

3.29.2 Safety

The SUBCONTRACTOR shall provide and use safety devices such as rubber gloves, protective barriers, and danger signs to protect and warn personnel in the test vicinity. Safety requirements shall conform to NEPA 70E.

3.29.3 Ground-Resistance Tests

The resistance of each grounding electrode system shall be measured using the fall-of-potential method defined in IEEE Std 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

- a. Single rod electrode - 25 ohms.
- b. Multiple rod electrodes - 5 ohms.
- c. Ground ring - 10 ohms or less.

3.29.4 Low-Voltage Cable Test

After installation, but just prior to terminal connection, low voltage cables shall be tested as follows:

- a. One thousand volt "Megger" test with all other conductors in each conduit or cable grounded. The final resistance of each conductor shall not be less than one (1) megohm.
- b. Continuity test of each conductor from terminal to terminal and phase identification check of power conductors.
- c. Suitable records shall be kept of tests, indicating the "Megger" readings, continuity test, and conductor identification markings. All tests shall be witnessed and signed by a Representative of the SUBCONTRACTOR. A duplicate record of all tests shall be furnished to the CONTRACTOR. Prior to testing, the SUBCONTRACTOR shall submit his test record form for approval of the CONTRACTOR.

- d. Any length of wires or cable failing under the above tests shall be replaced by the SUBCONTRACTOR at no additional cost to the CONTRACTOR.
- e. The SUBCONTRACTOR shall furnish instruments and personnel required to perform these tests.
- f. Tests shall be witnessed by a representative of the CONTRACTOR and the test form shall provide sufficient space for his signature.

3.30 MANUFACTURER'S FIELD SERVICE

3.30.1 Onsite Training

The SUBCONTRACTOR shall conduct a training course for the operating staff as designated by the CONTRACTOR. The training period shall consist of a minimum of 16 hours of normal working time and shall start after the system is functionally completed but prior to facility turnover. The course instruction shall cover pertinent points involved in operating, starting, stopping, and servicing the equipment, as well as all major elements of the operation and maintenance manuals. Additionally, the course instructions shall demonstrate routine maintenance operations.

3.30.2 Installation Engineer

After delivery of the equipment, the SUBCONTRACTOR shall furnish one or more field engineers, regularly employed by the equipment manufacturer to supervise the installation of the equipment, assist in the performance of the onsite tests, initial operation, and instruct personnel as to the operational and maintenance features of the equipment.

3.31 ACCEPTANCE

Final acceptance of the facility will not be given until the SUBCONTRACTOR has successfully completed tests and after all defects in installation, material or operation have been corrected and SUBCONTRACTOR has met the requirements of the Exhibit "A", GC 8.6 FINAL INSPECTION AND ACCEPTANCE.

3.32 QUALITY ASSURANCE/QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These

areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall maintain and submit to CONTRACTOR records including but not limited to the following:

- (1) Delivery, storage, and handling of devices and equipment used.
- (2) Conformance of materials to the requirements of these specifications.
- (3) Inspection of devices and equipment installed.
- (4) Field testing of devices and equipment.
- (5) Installation of devices and equipment to these requirements and applicable codes and standards.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be supplied to the CONTRACTOR within one working day of the inspection or test.

3.33 TELEMETRY CONTROL SYSTEM

The wireless telemetry control system installation shall match the installation for Cells 7 and 8, unless approved otherwise by the CONTRACTOR. The control logic for the PLC shall match the control logic used for Cells 7 and 8. A copy of the control logic is in Attachment A.

The SUBCONTRACTOR shall integrate the new crest pad system into the CONTRACTOR's telemetry control system for the Cells 1-8. The SUBCONTRACTOR shall notify the CONTRACTOR 30 days prior to integration with the CONTRACTOR's existing telemetry control system.

ATTACHMENT A

TRENCH PUMP CONTROL SYSTEM
PROGRAMMABLE LOGIC CONTROLLER (PLC) CONTROL LOGIC

FOR

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)
CELLS 9 & 10

Processor Information

Processor Type: 1747-L531E 5/03 CPU - 8K Mem. OS302 Series C FRN 10 and later

Processor Name: EDRF8

Total Memory Used: 549 Instruction Words Used - 329 Data Table Words Used

Total Memory Left: 3547 Instruction Words Left

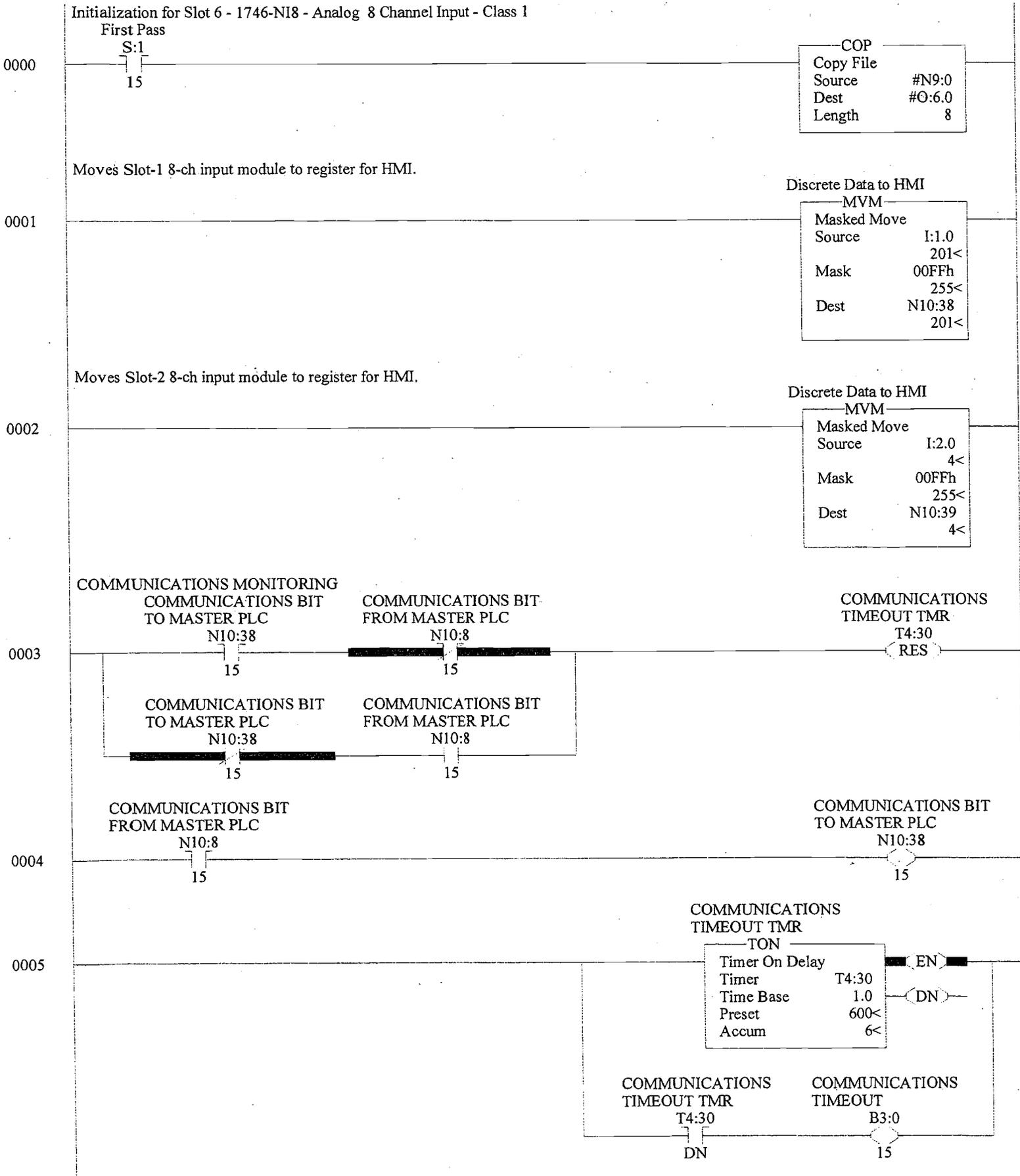
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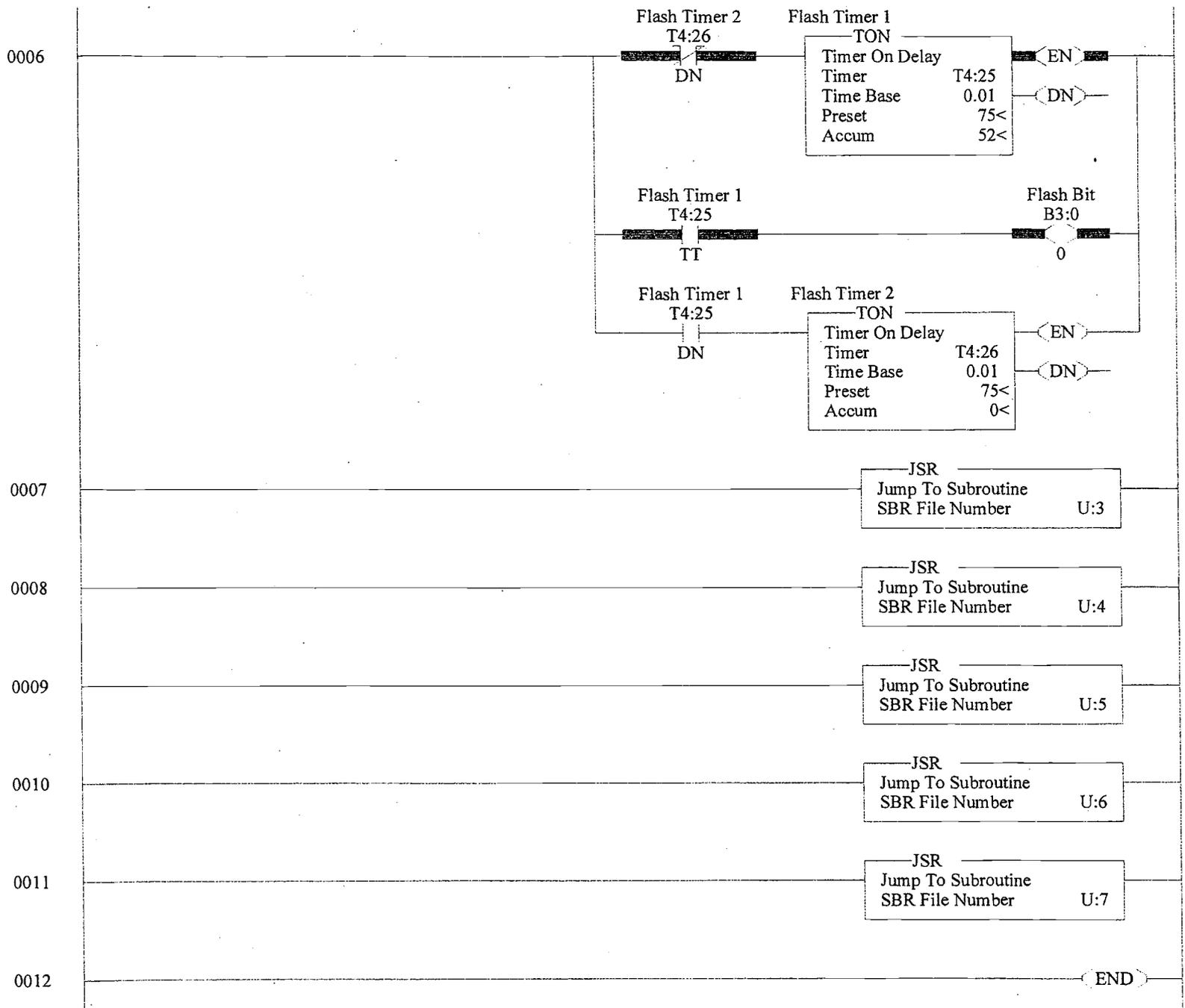
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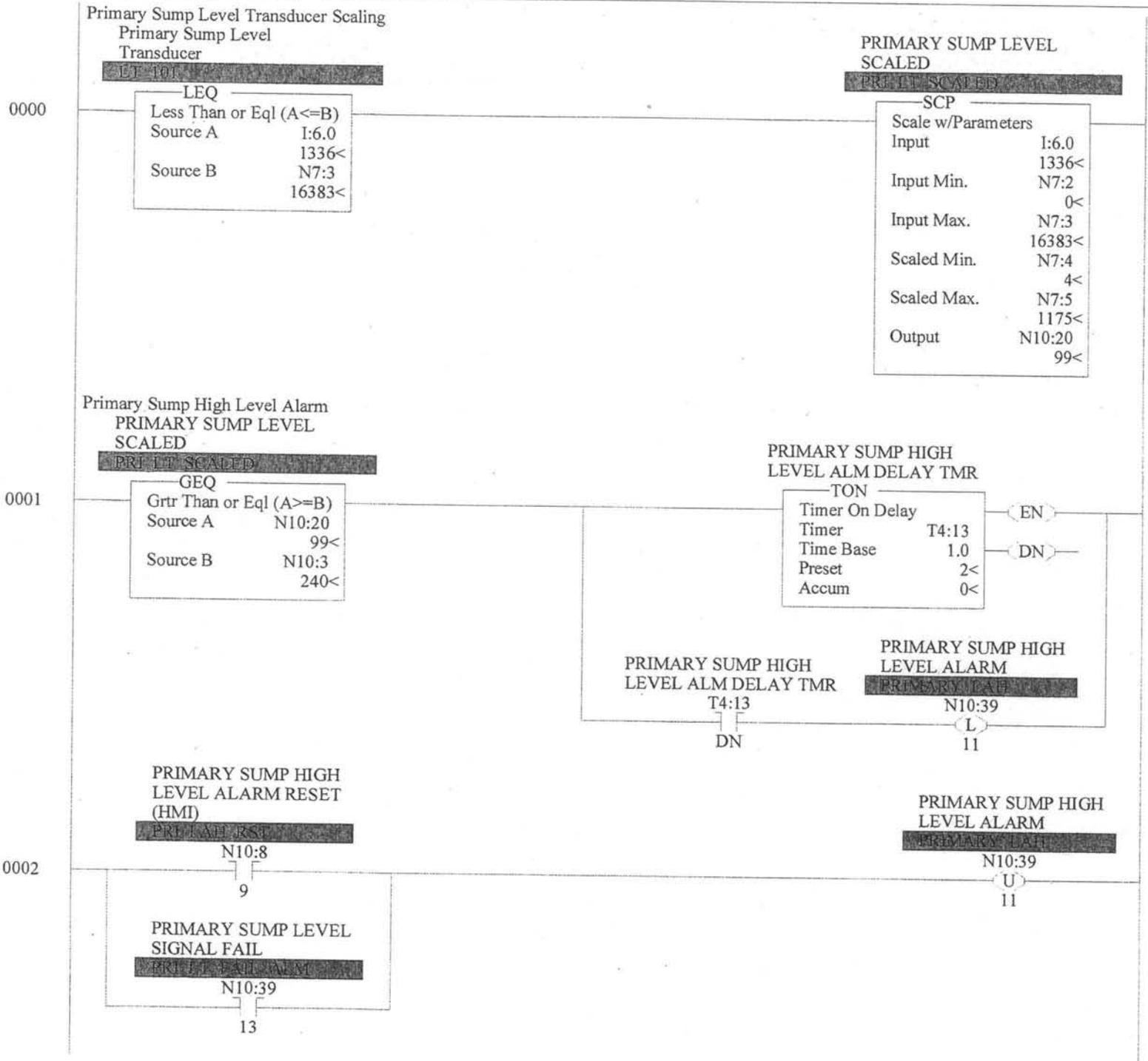
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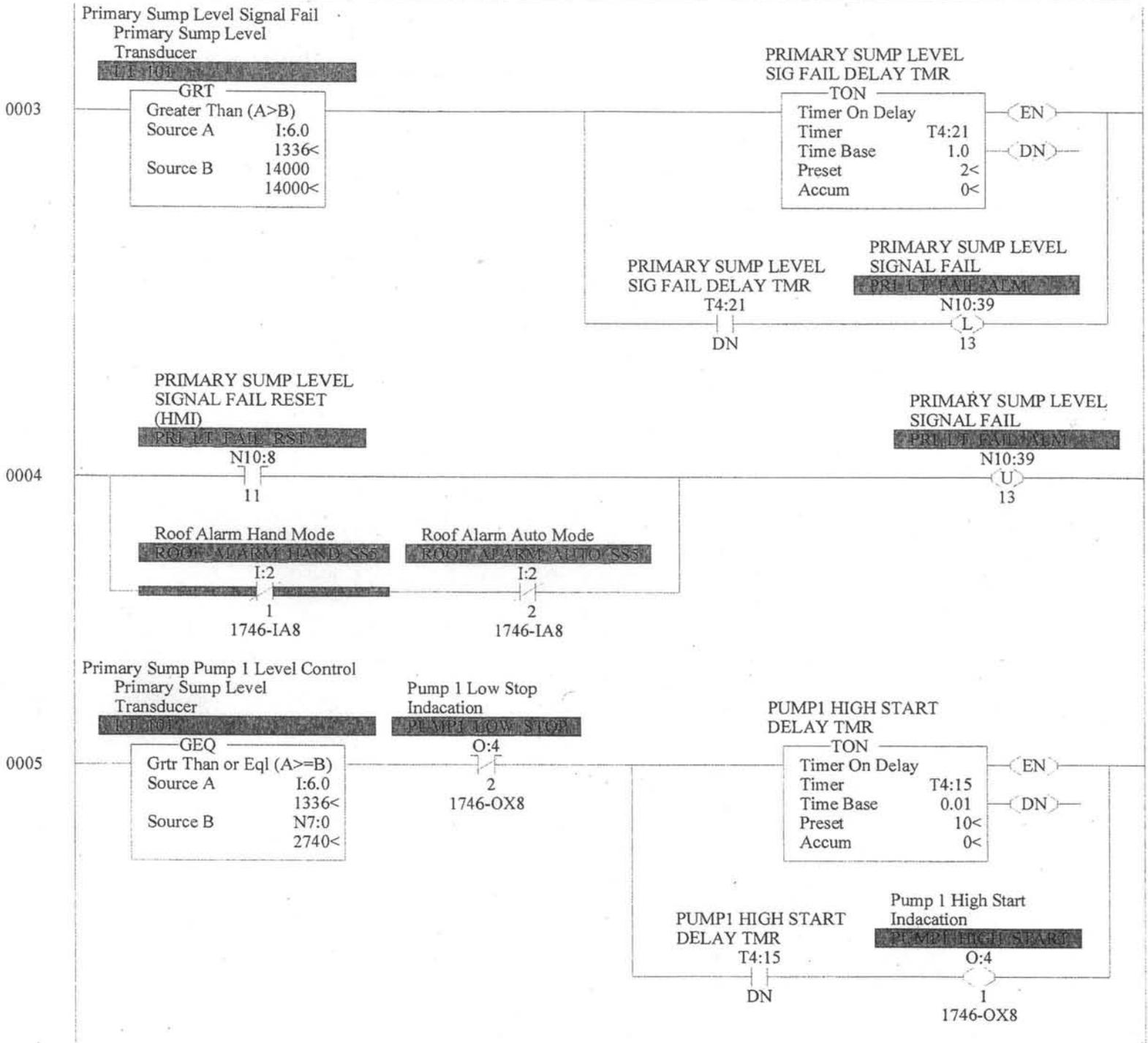
Program File List

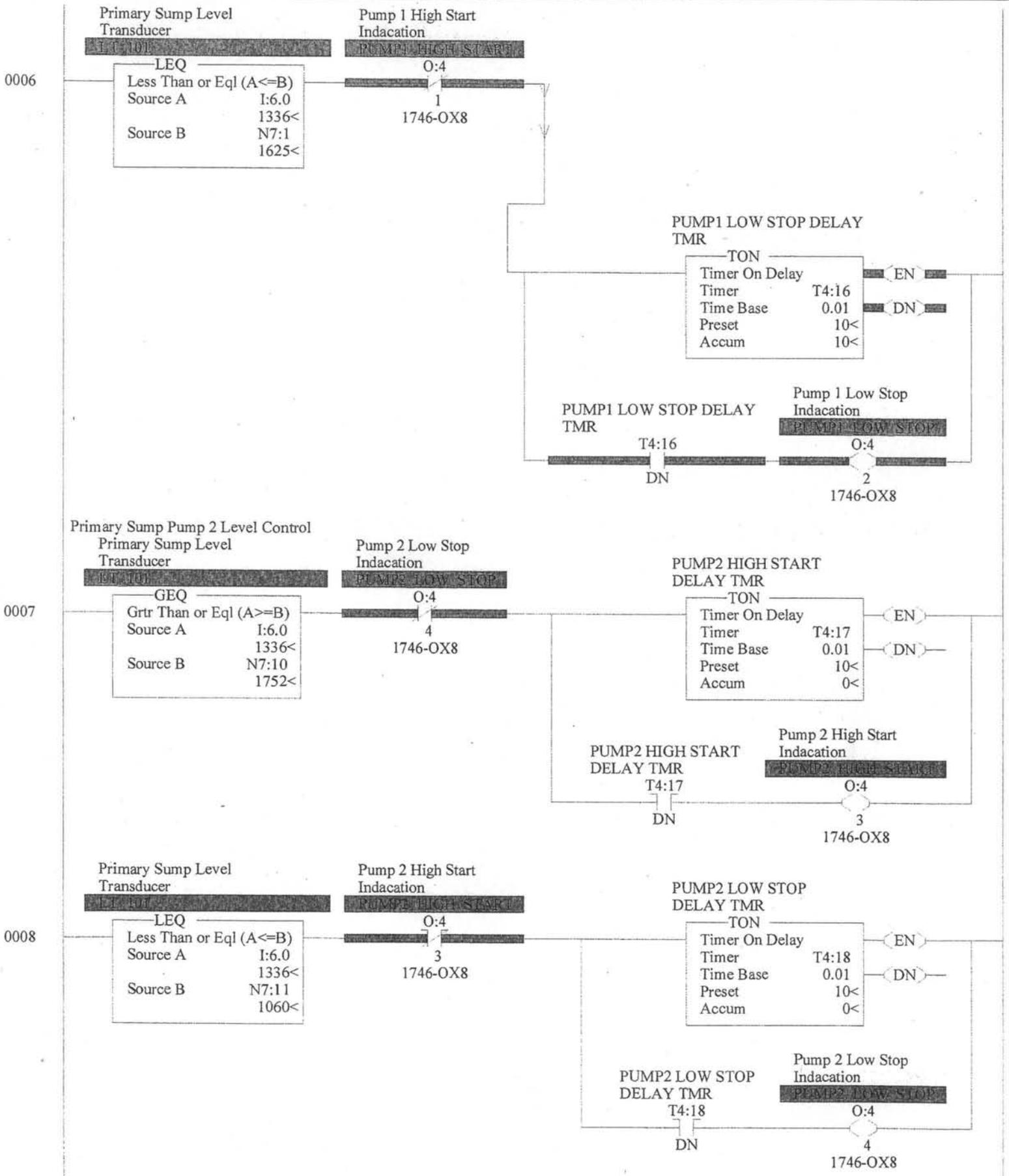
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	1	SYS	0	No	0
MAIN	2	LADDER	13	No	258
LEVEL	3	LADDER	17	No	699
UMP	4	LADDER	21	No	885
ALARM	5	LADDER	4	No	227
LOW	6	LADDER	19	No	597
RUNTIMES	7	LADDER	28	No	852

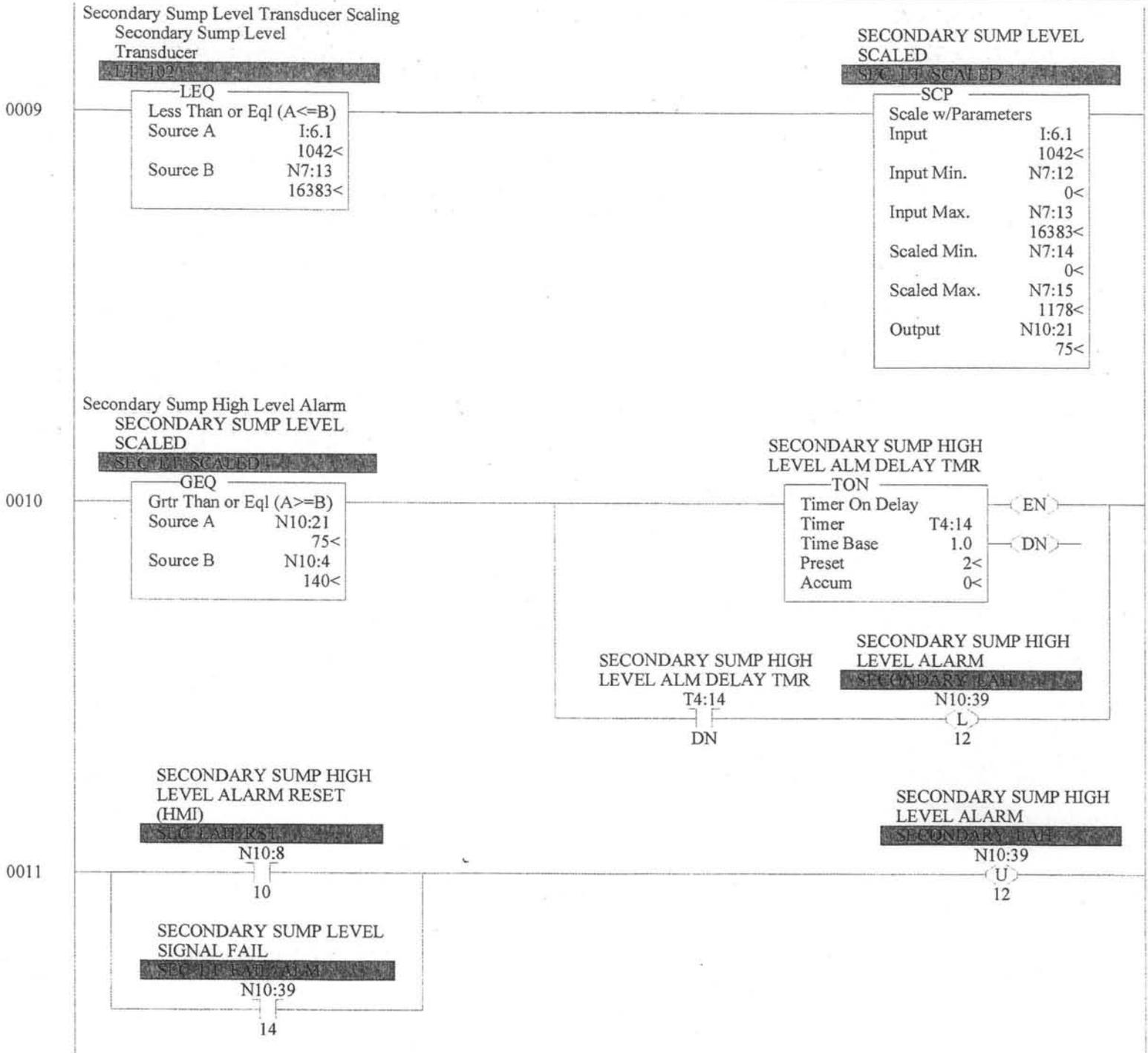


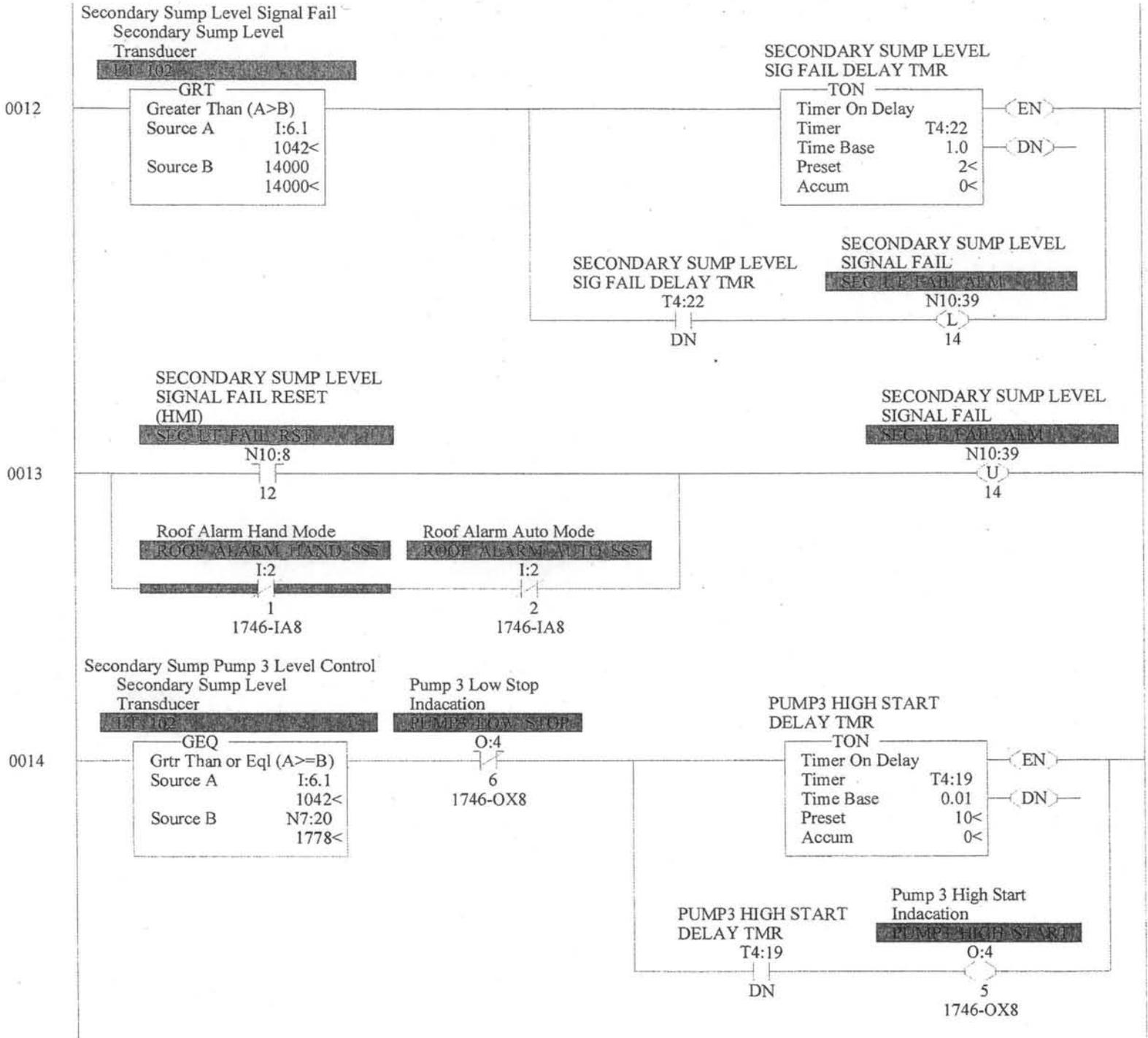


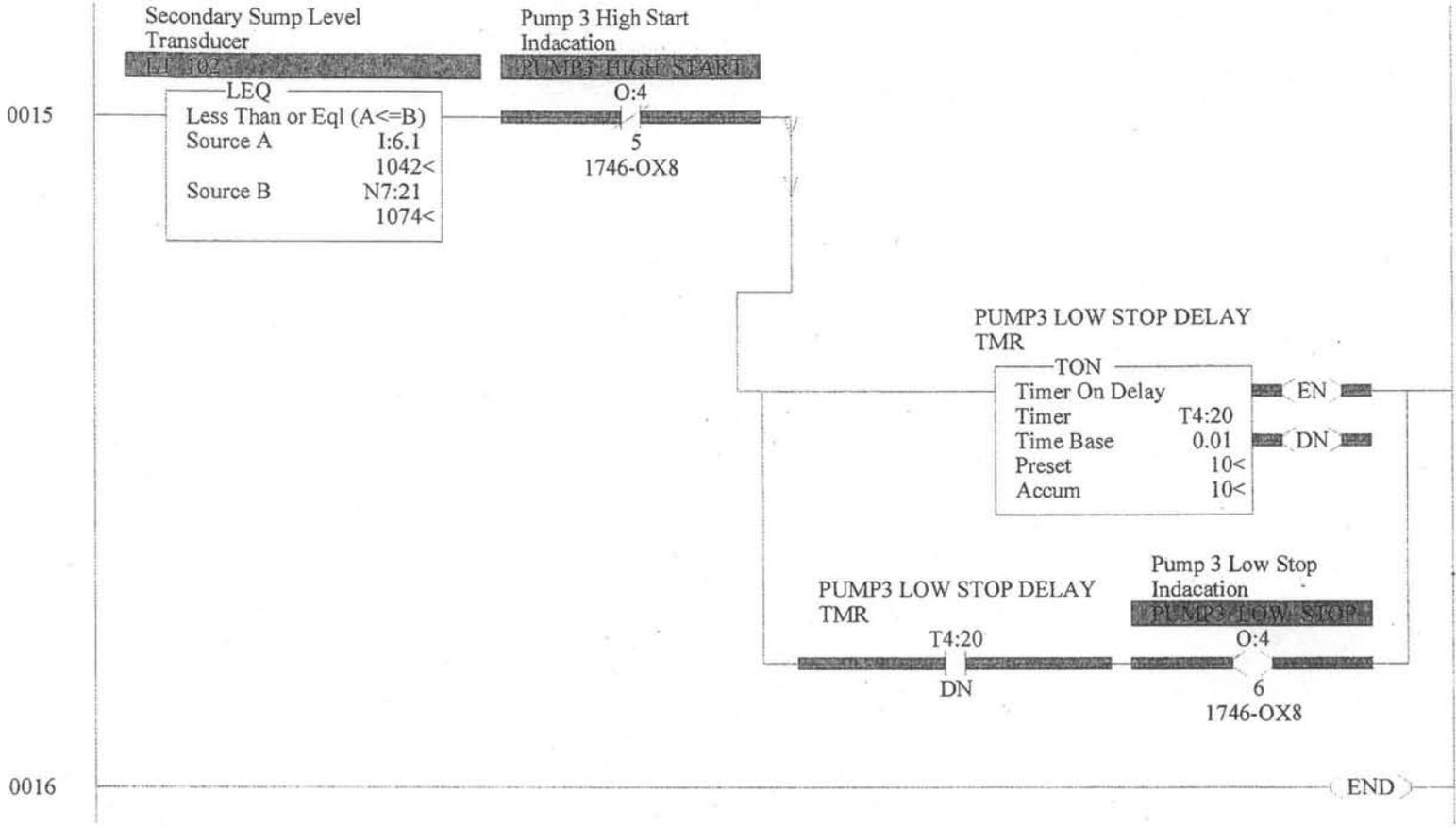


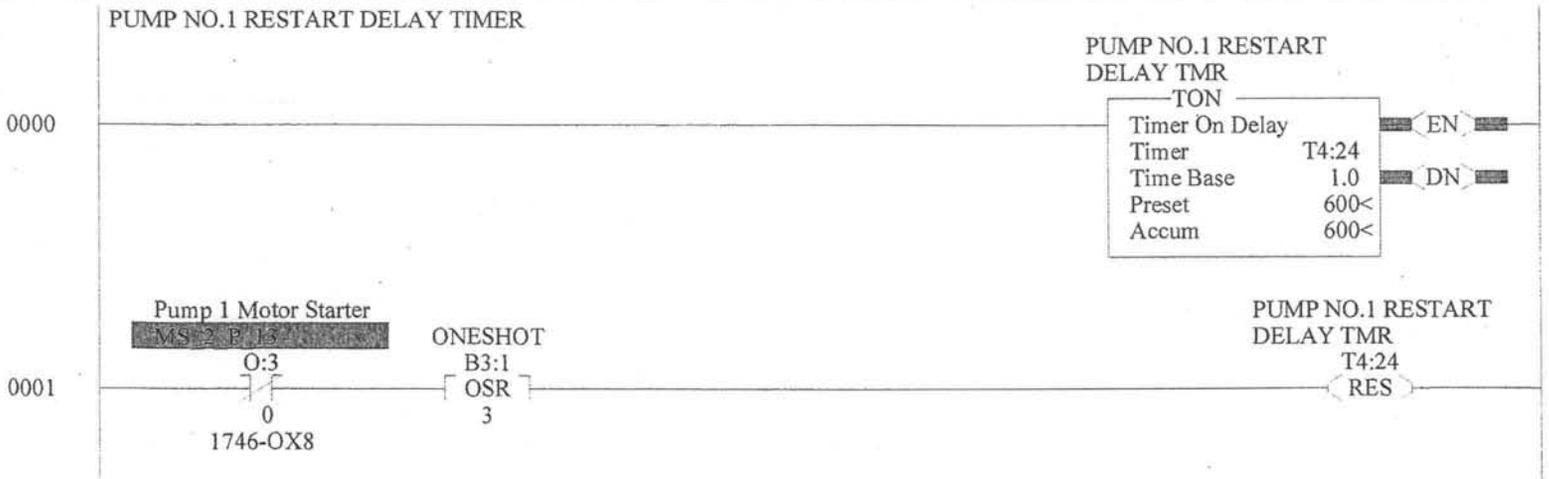




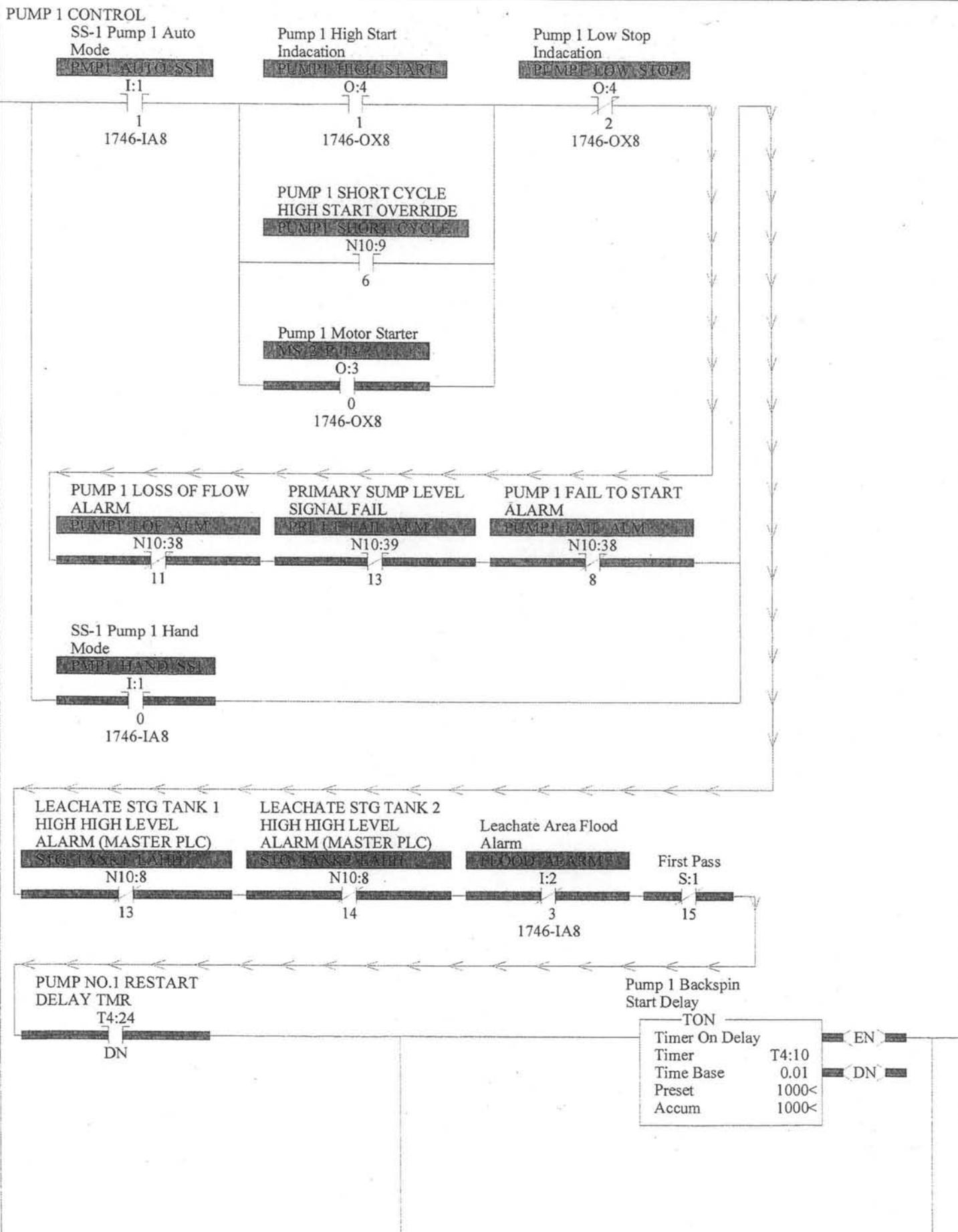


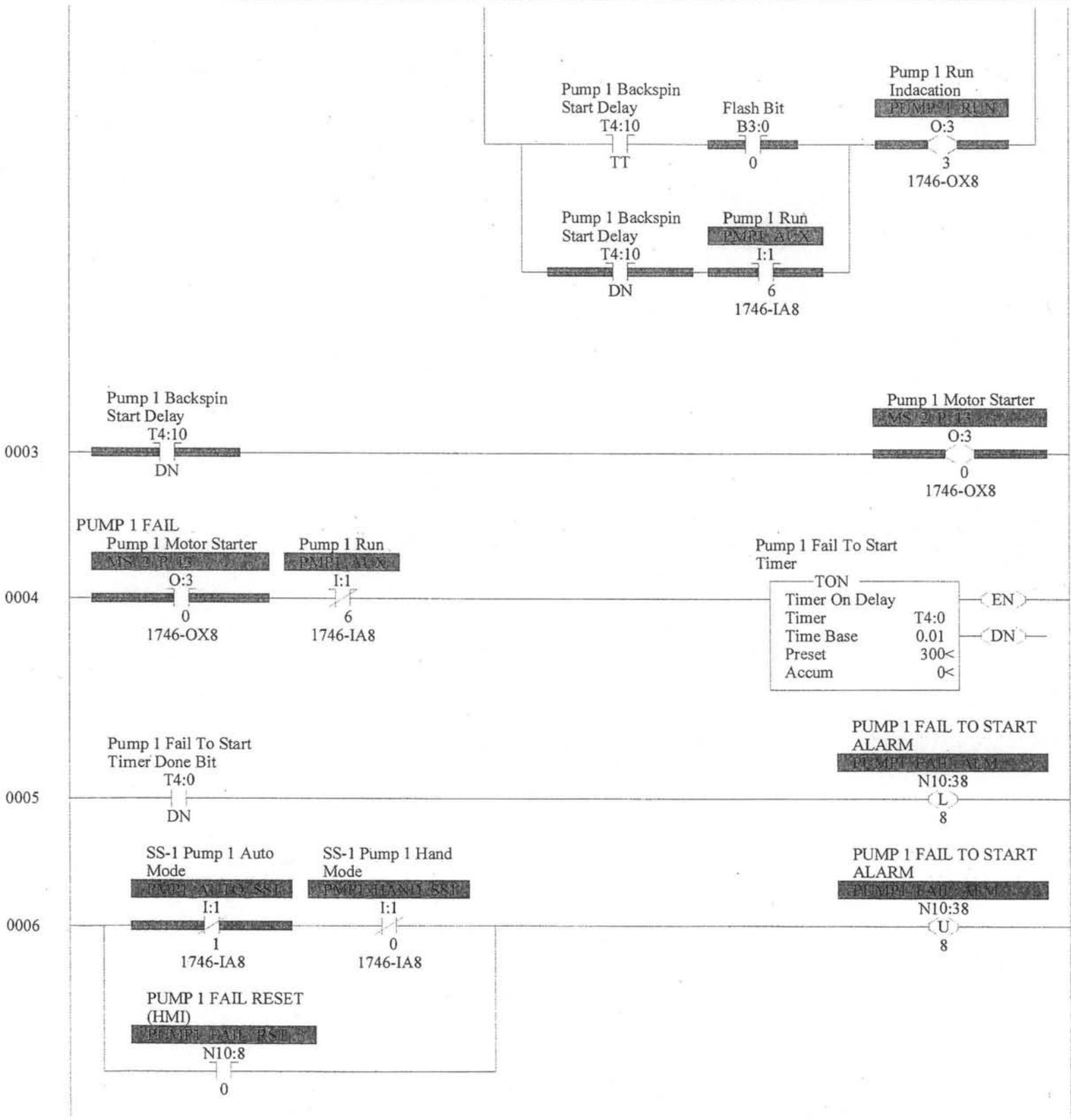


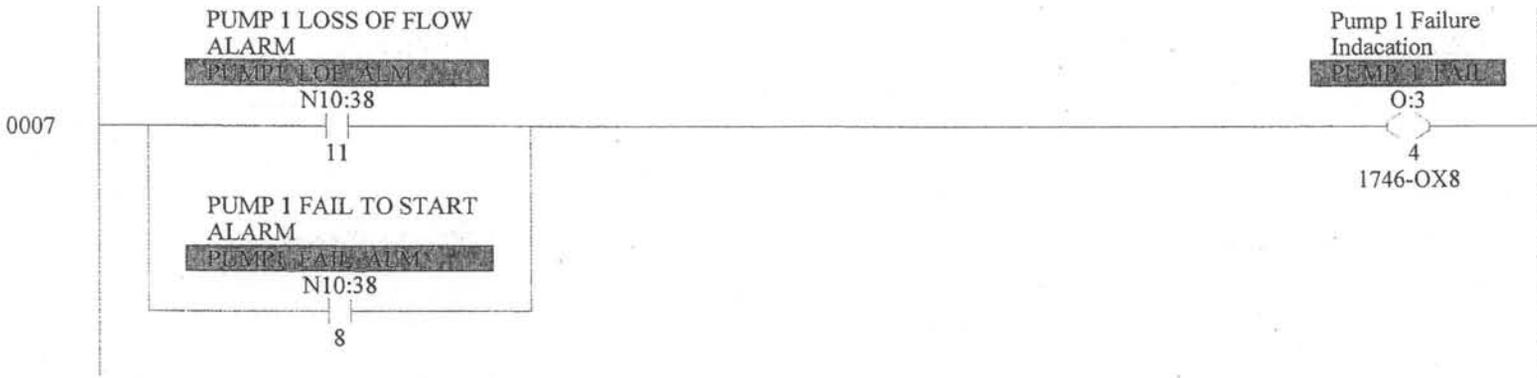


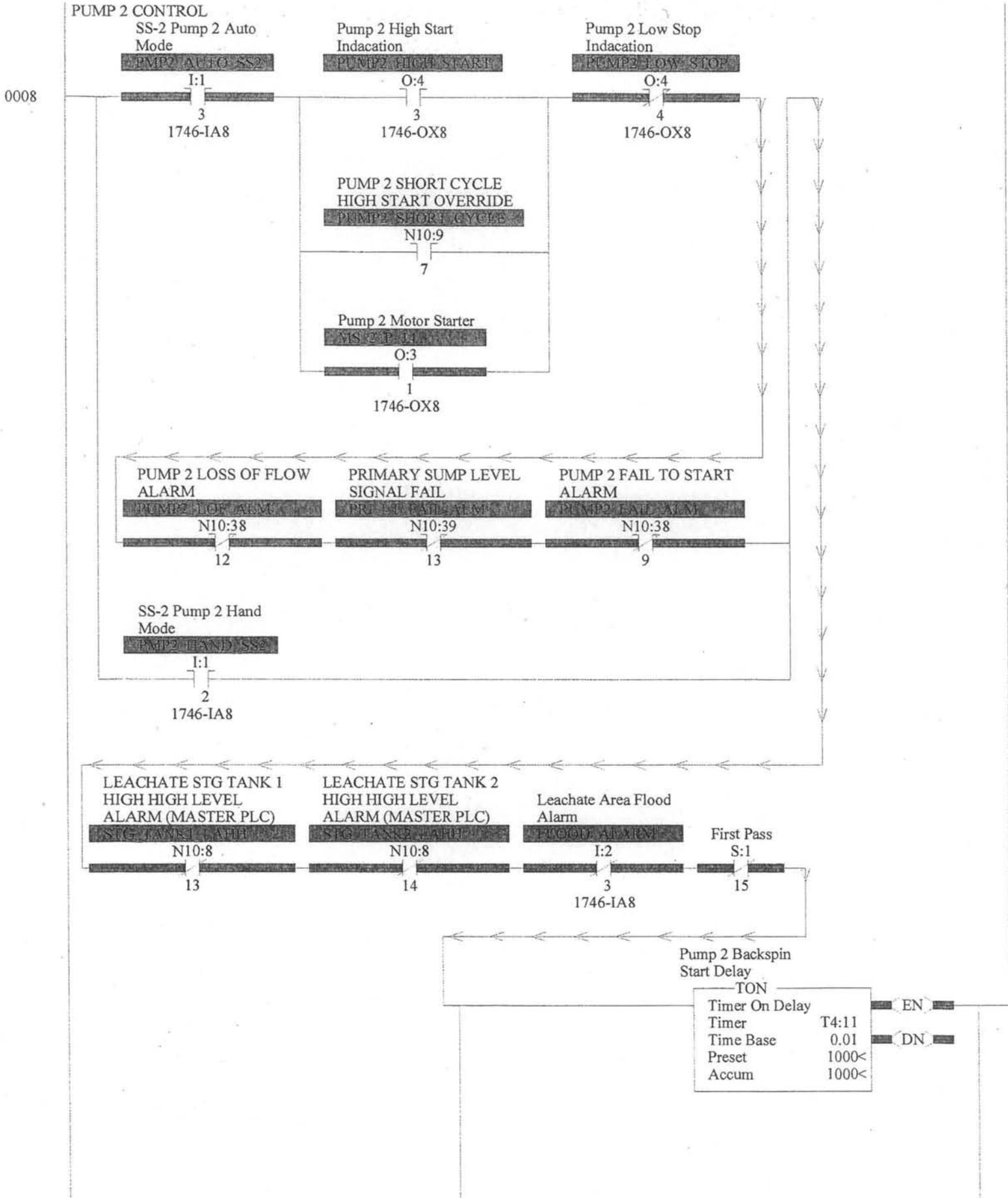


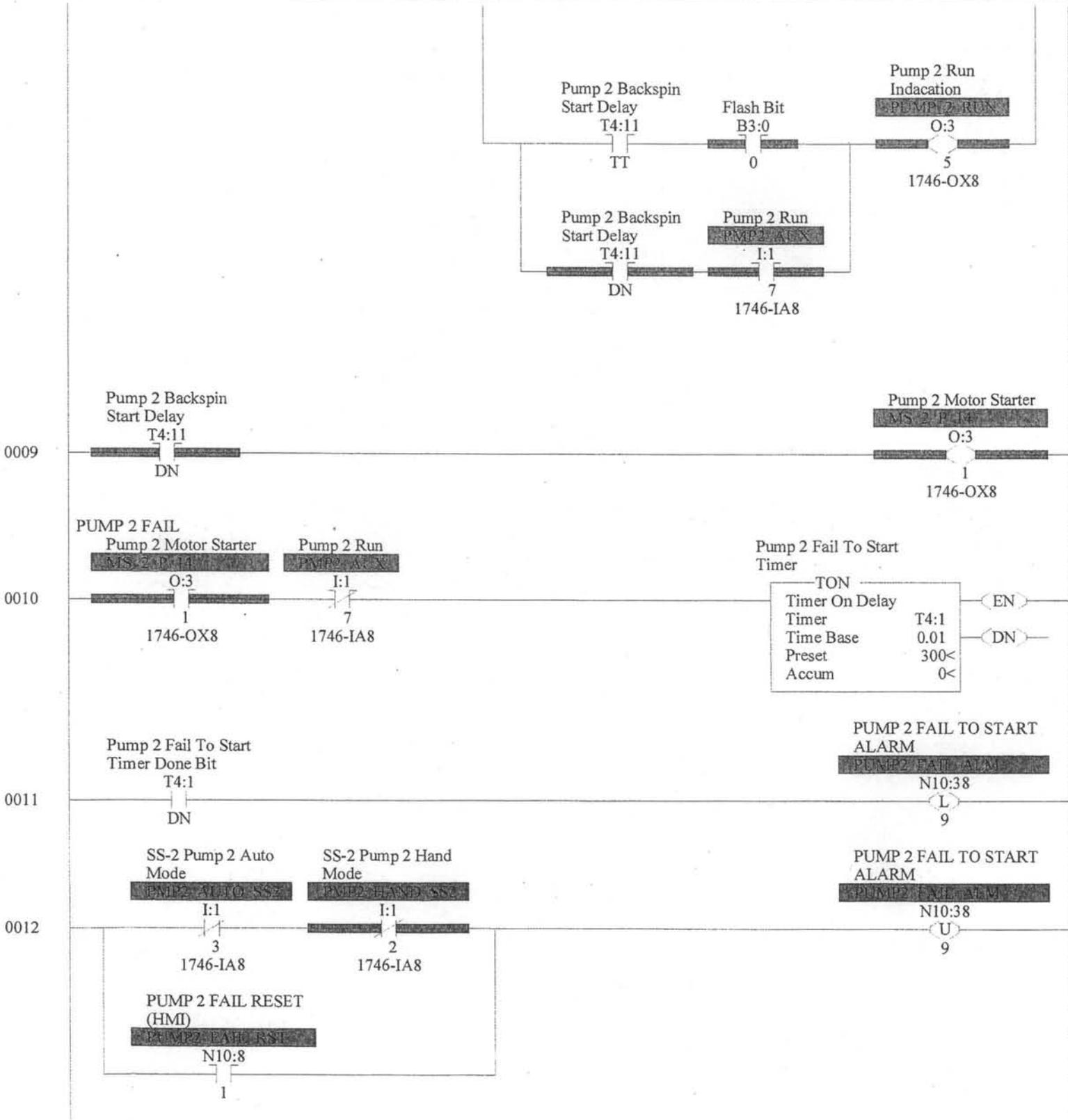
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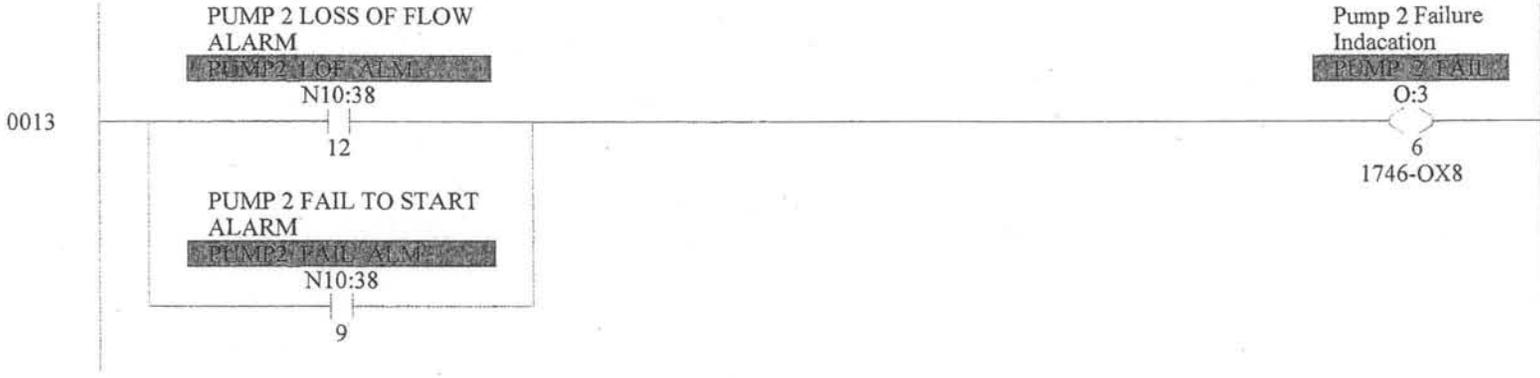




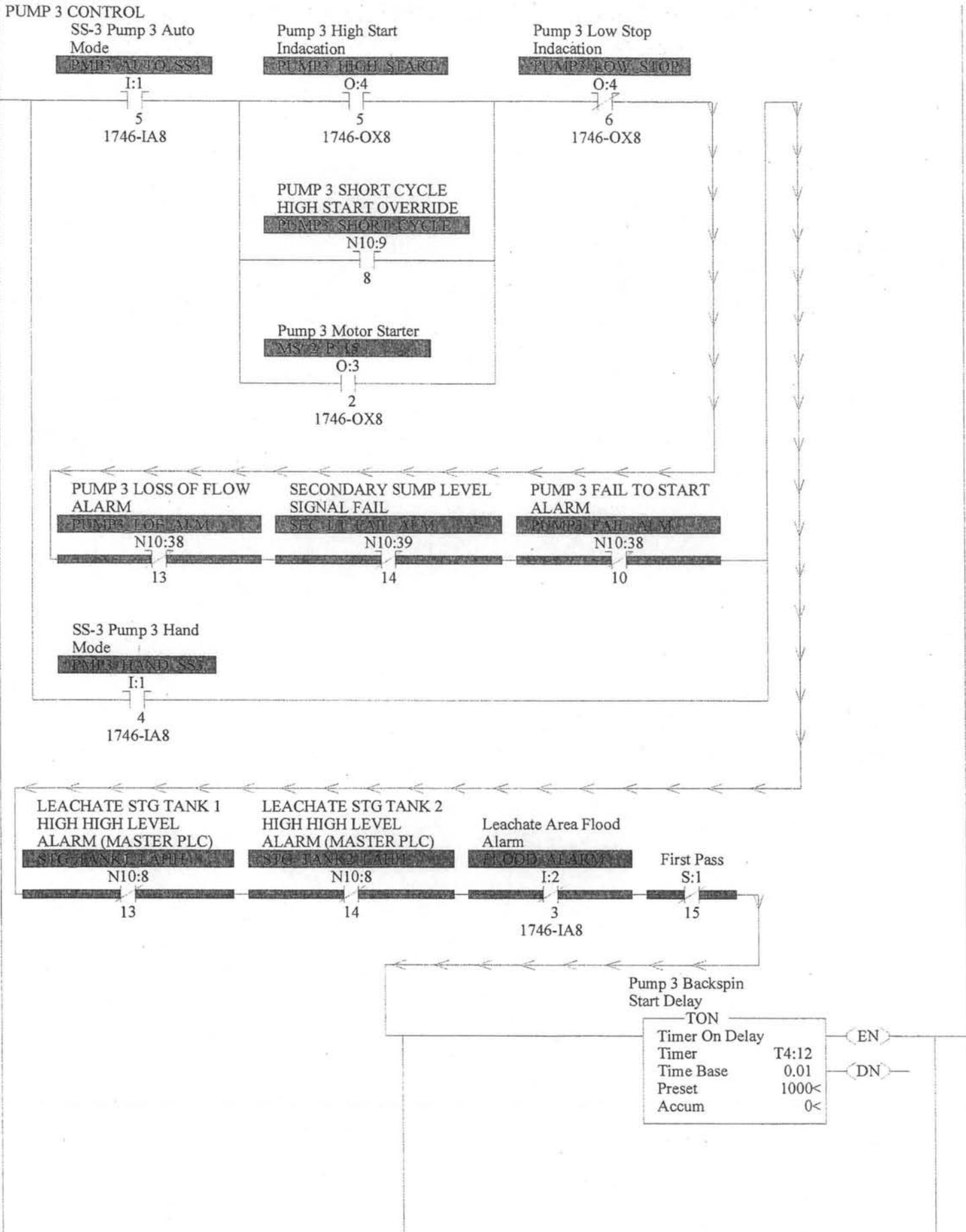


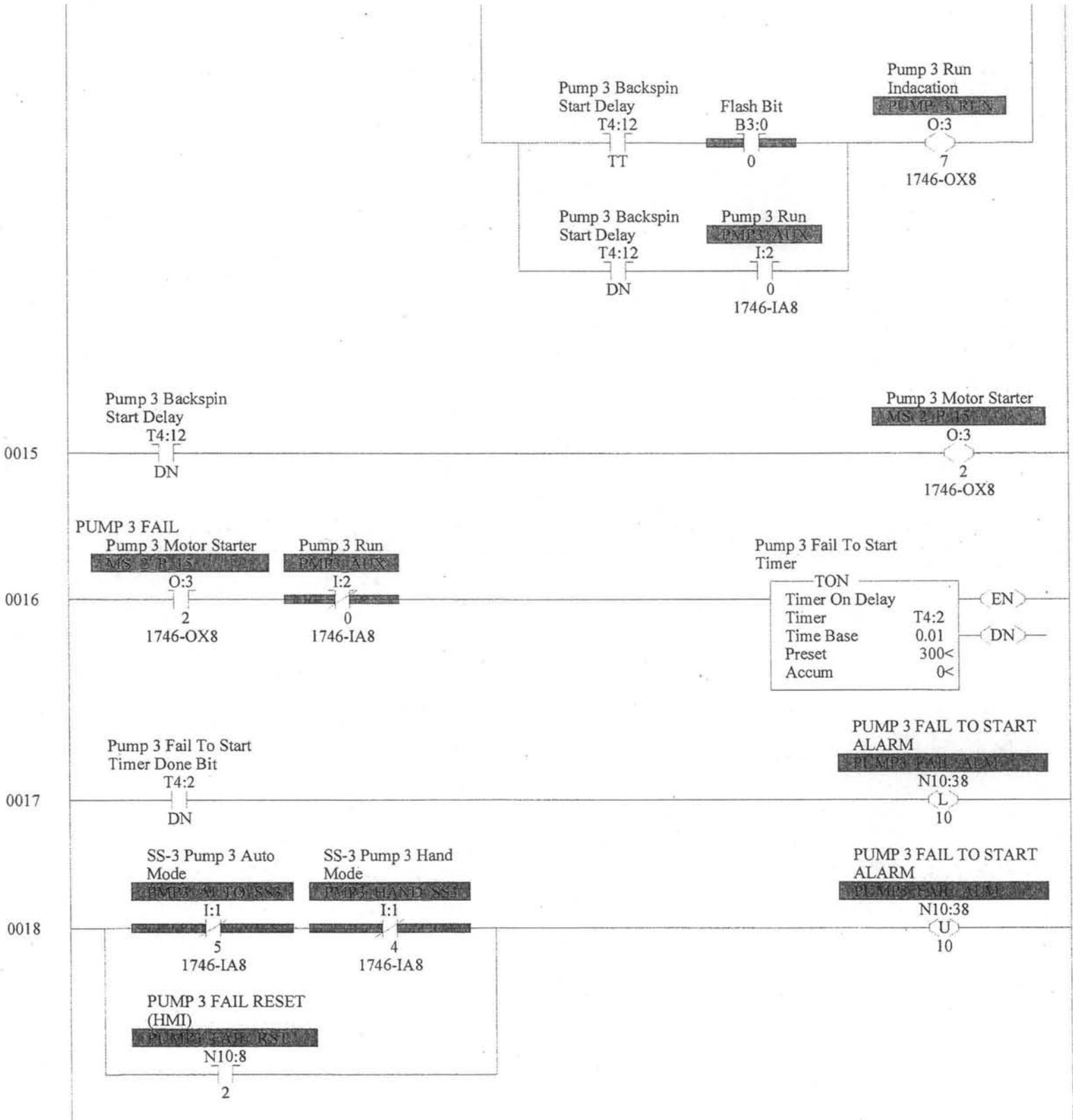


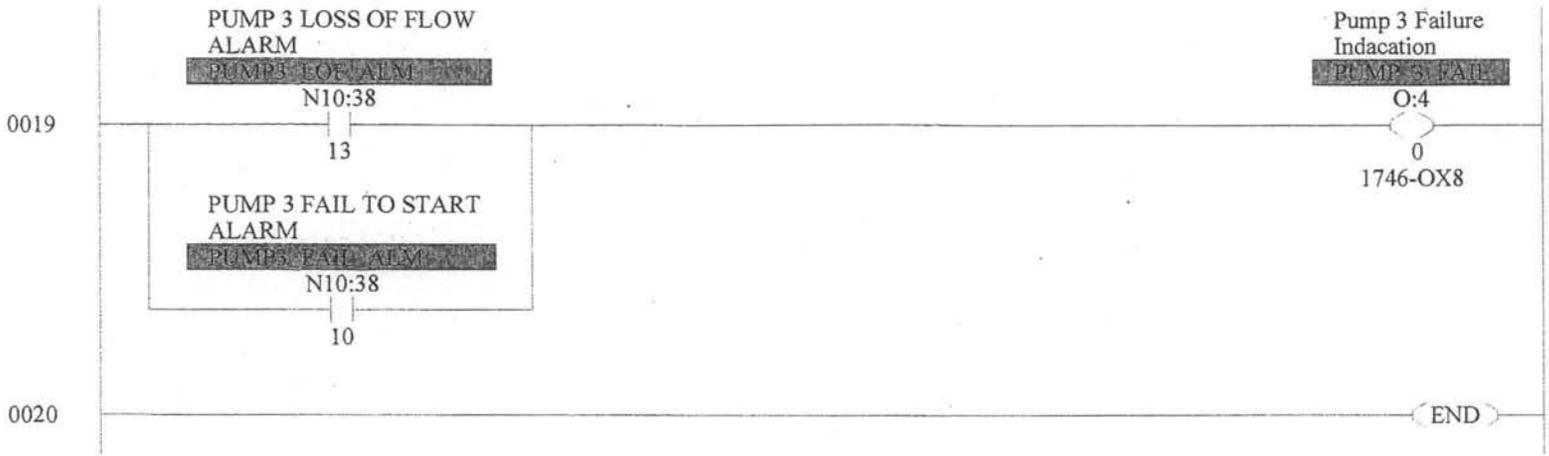


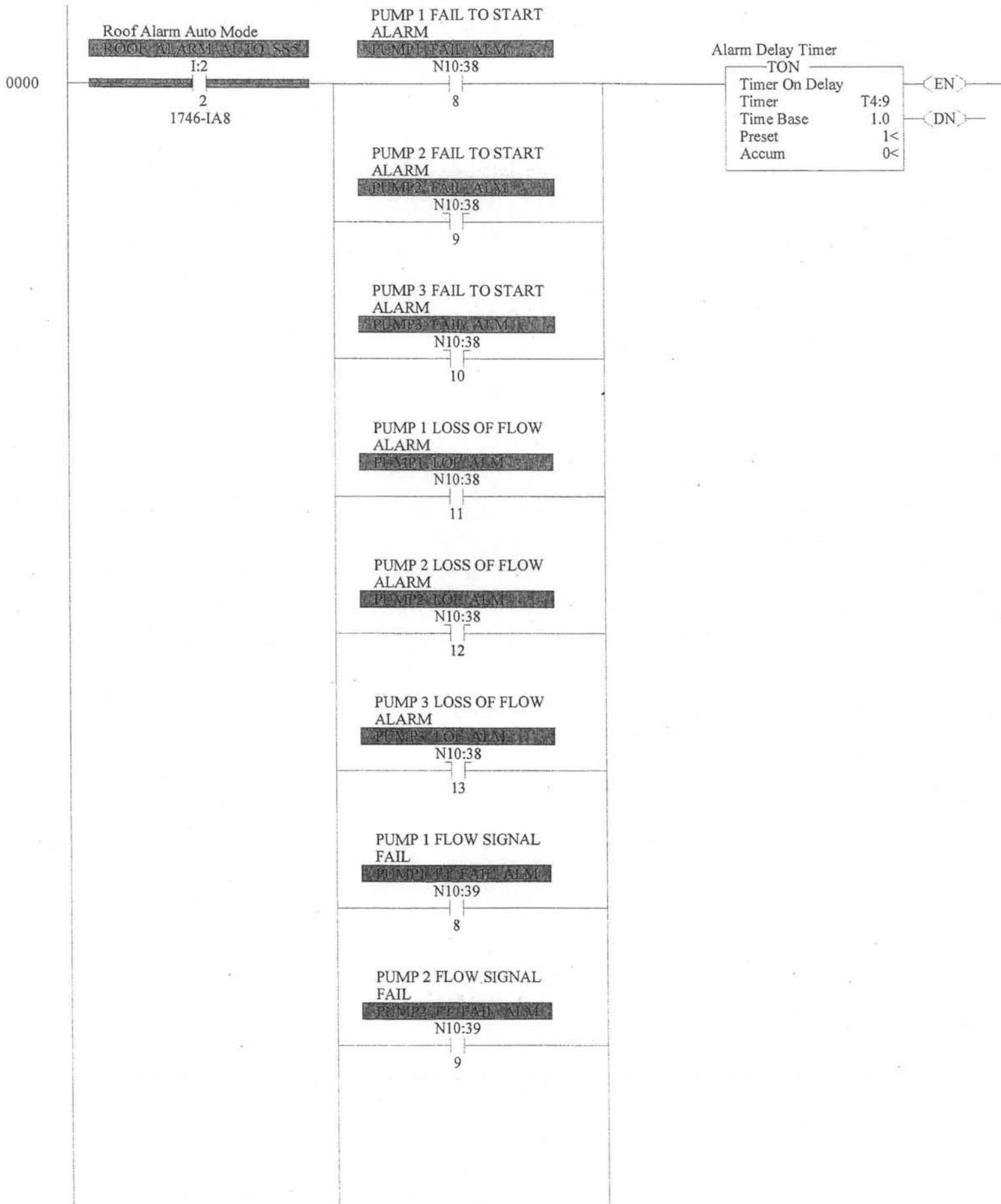


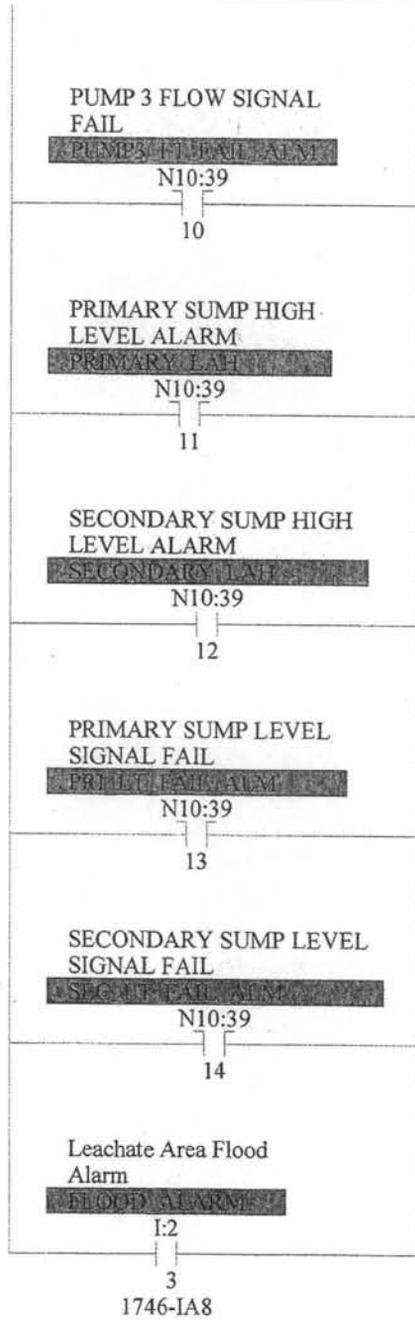
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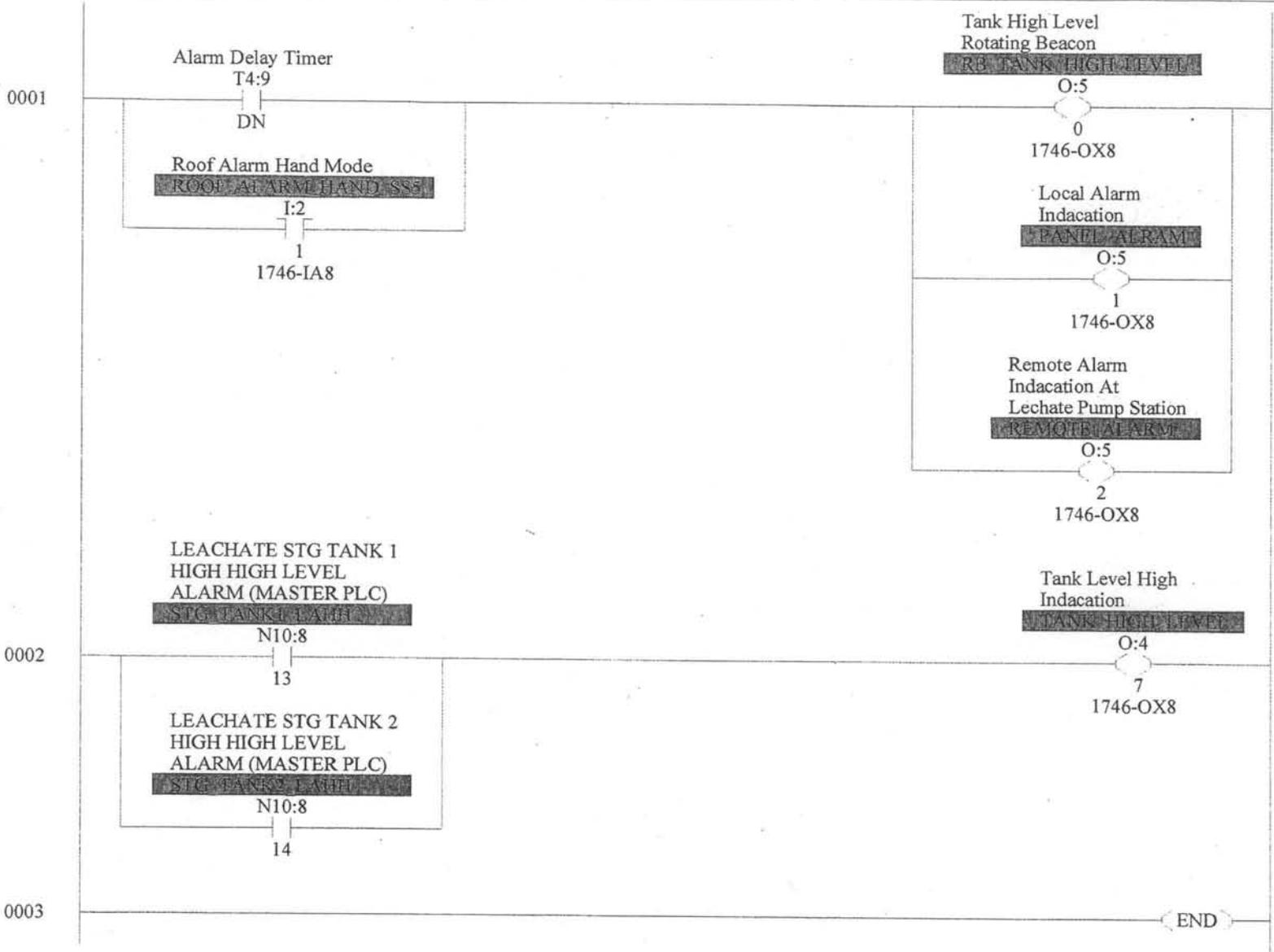












PRIMARY HIGH FLOW PUMP (PUMP 1) FLOW TRANSMITTER SCALING

0000

PUMP 1 FLOW SCALED

PUMP 1 FLOW SCALED

SCP

Scale w/Parameters	
Input	I:6.4 9510<
Input Min.	N7:6 0<
Input Max.	N7:7 16383<
Scaled Min.	N7:8 0<
Scaled Max.	N7:9 3000<
Output	N10:23 1763<

0001

PRIMARY HIGH FLOW PUMP (PUMP 1) LOSS OF FLOW ALARM

Pump 1 Motor Starter

MS:3 P15

O:3

0
1746-OX8

PUMP 1 ALARM ENABLE TMR

PUMP 1 ALARM ENABLE TMR

TON

Timer On Delay		EN
Timer	T4:3	DN
Time Base	1.0	
Preset	60<	
Accum	60<	

0002

PUMP 1 ALARM ENABLE TMR

T4:3
DN

PUMP 1 FLOW SCALED

PUMP 1 FLOW SCALED

LES

Less Than (A<B)

Source A	N10:23 1763<
Source B	N10:0 0<

PUMP 1 LOSS OF FLOW DELAY TMR

PUMP 1 LOSS OF FLOW DELAY TMR

TON

Timer On Delay		EN
Timer	T4:4	DN
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Preset	200<	
Accum	0<	

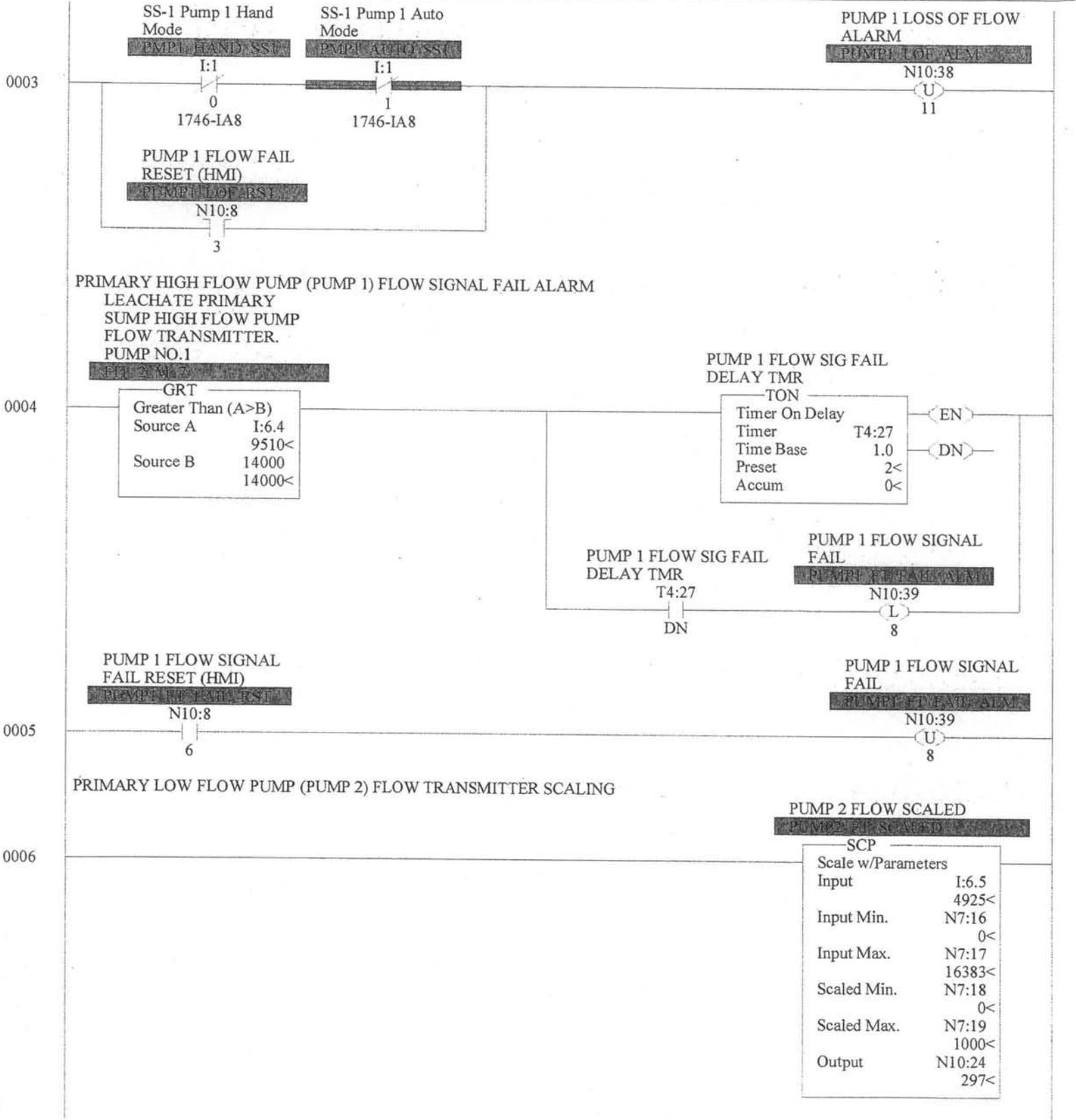
PUMP 1 LOSS OF FLOW DELAY TMR

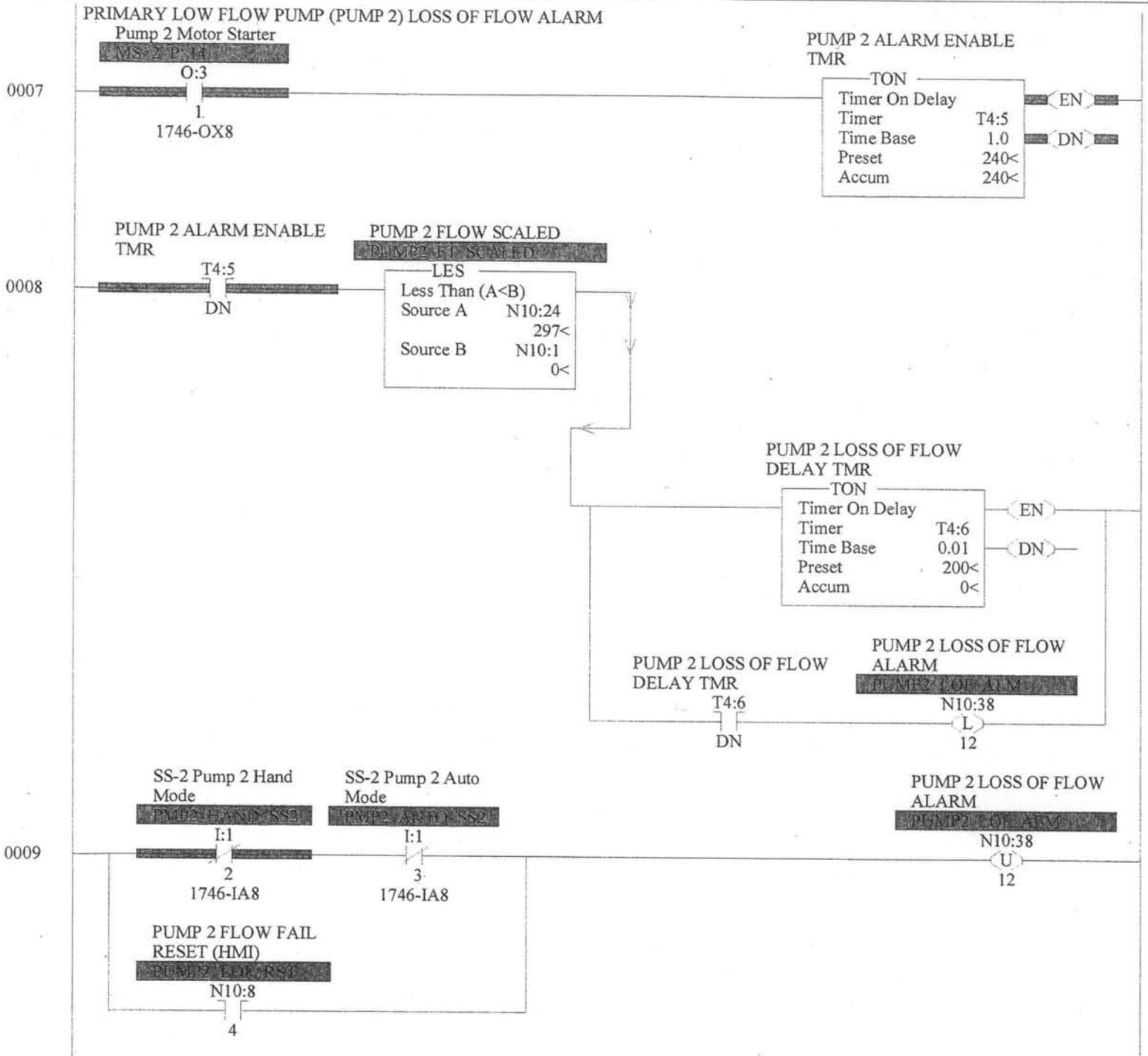
T4:4
DN

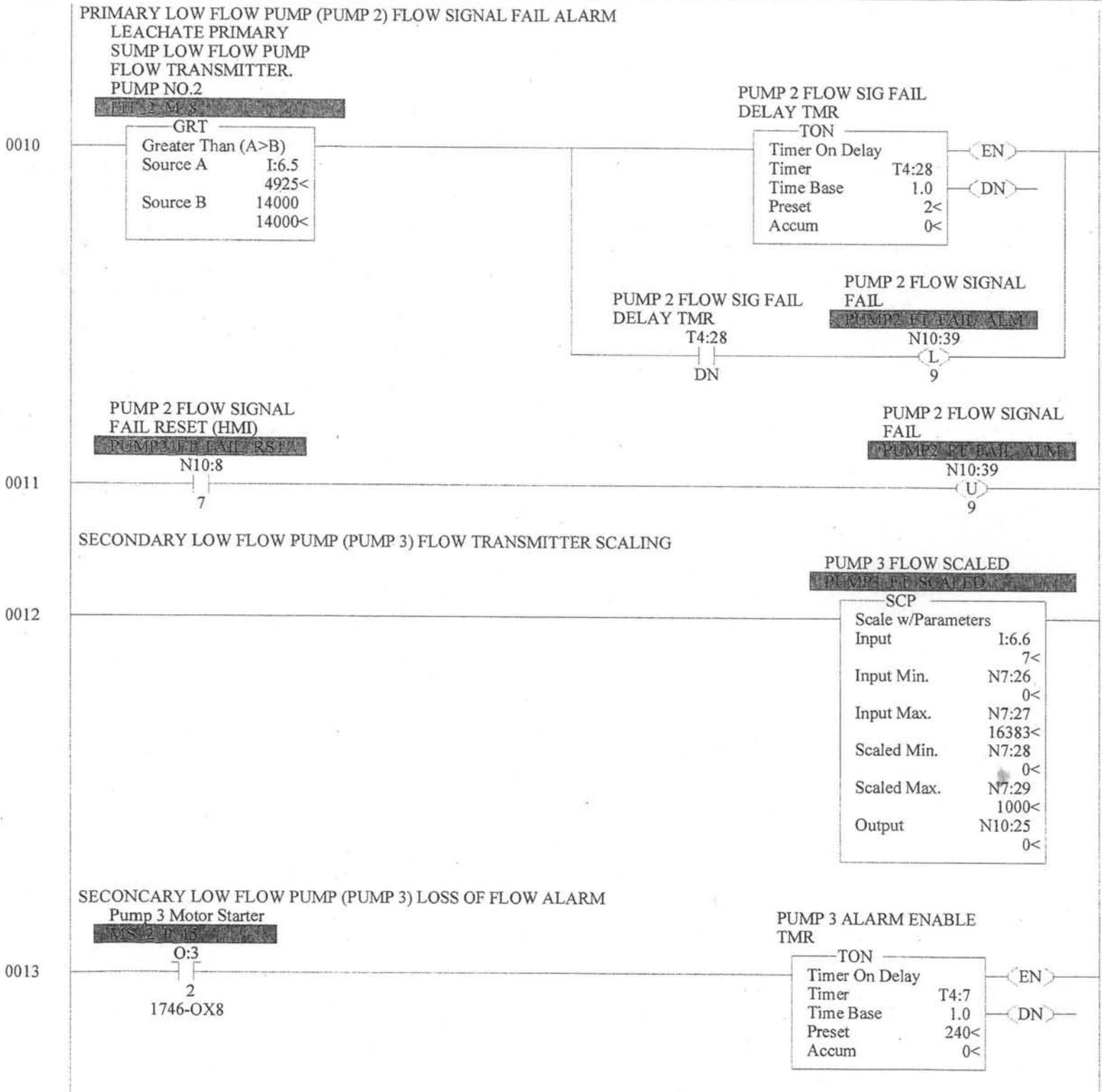
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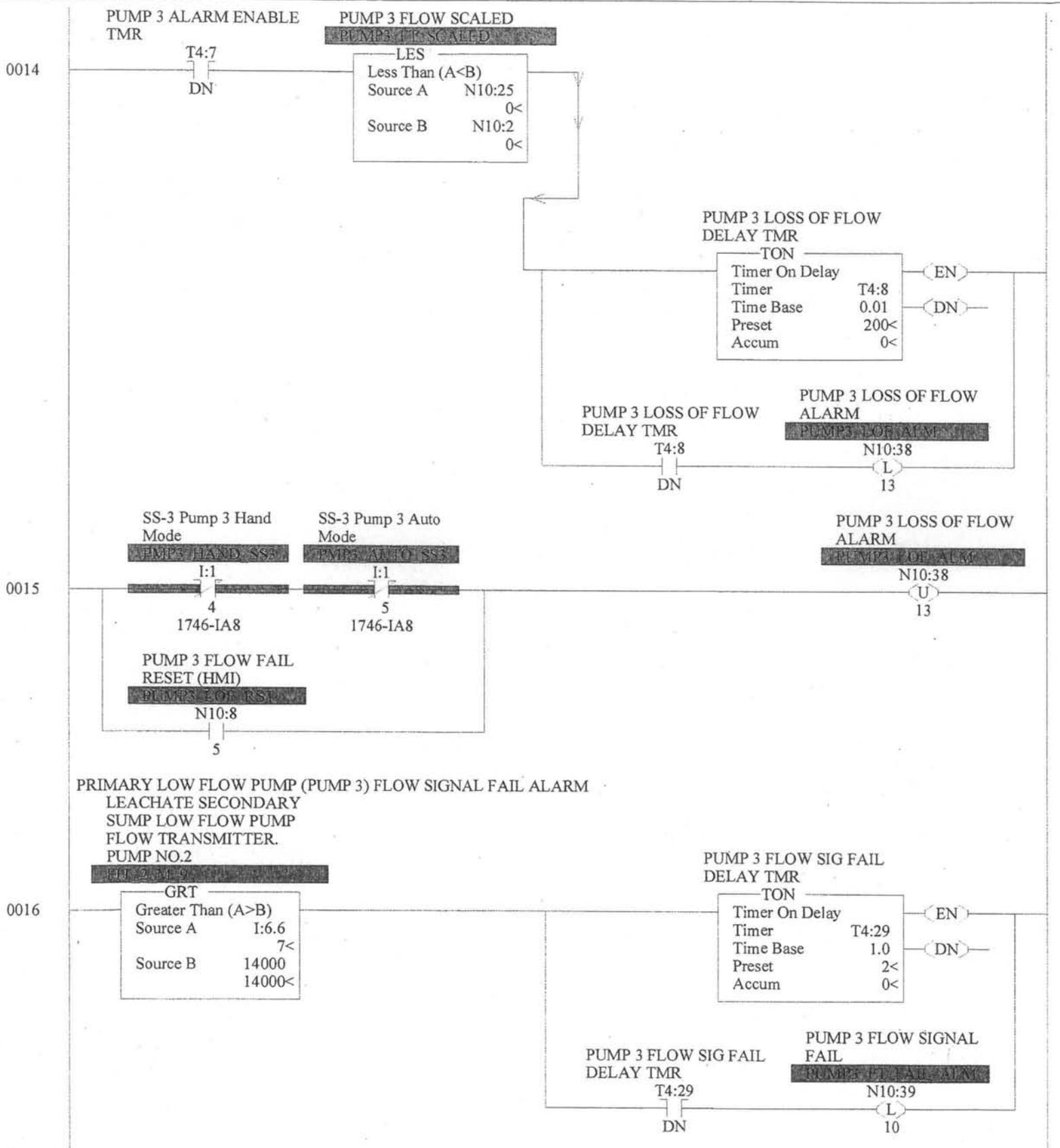
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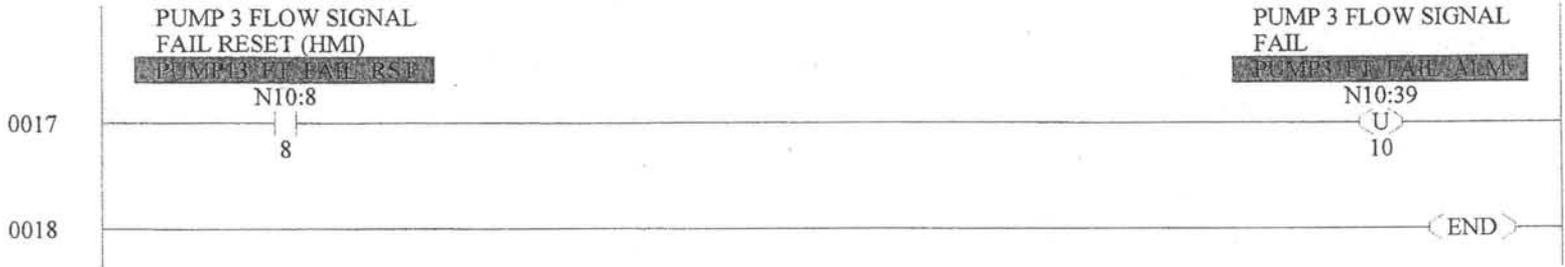
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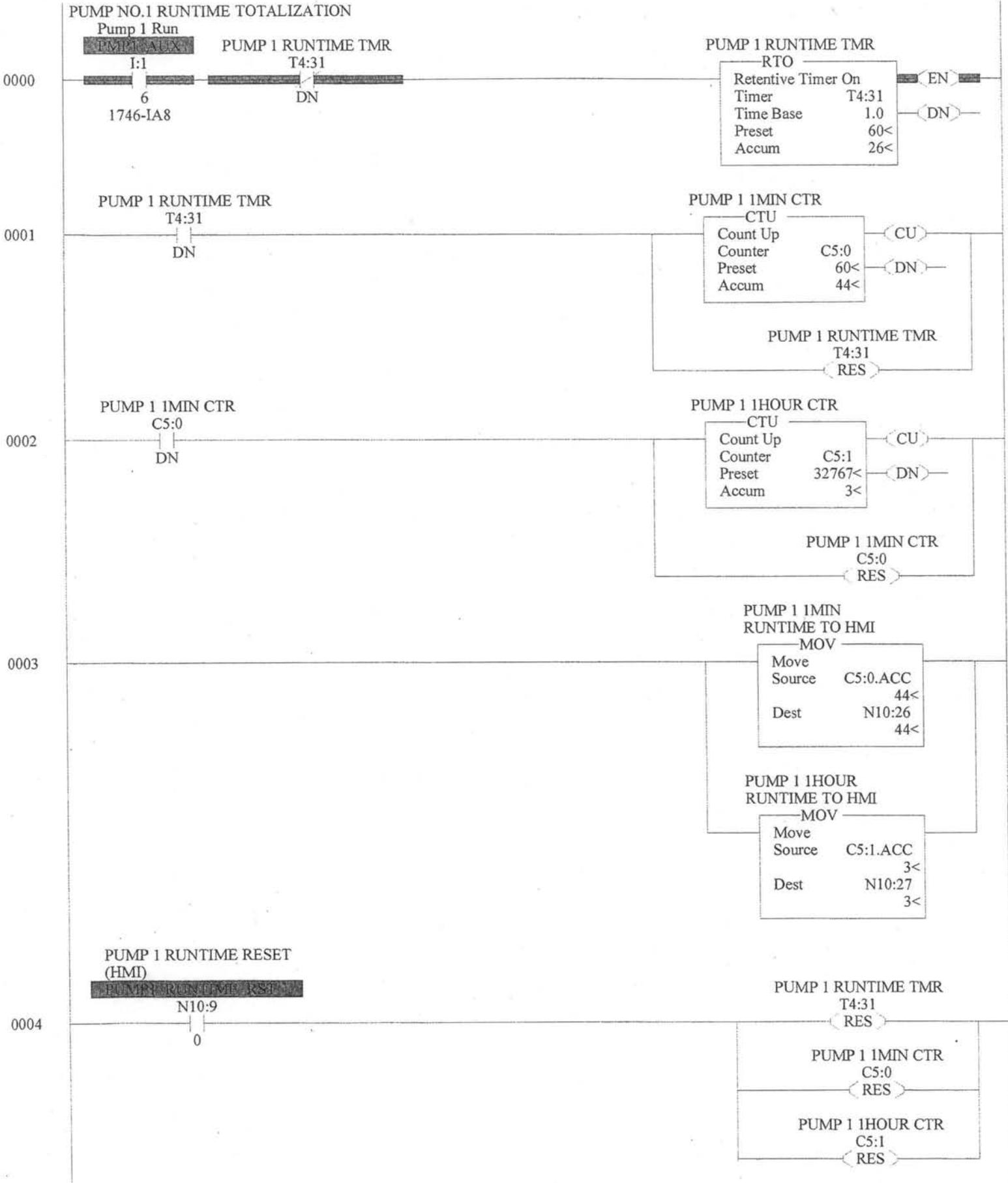


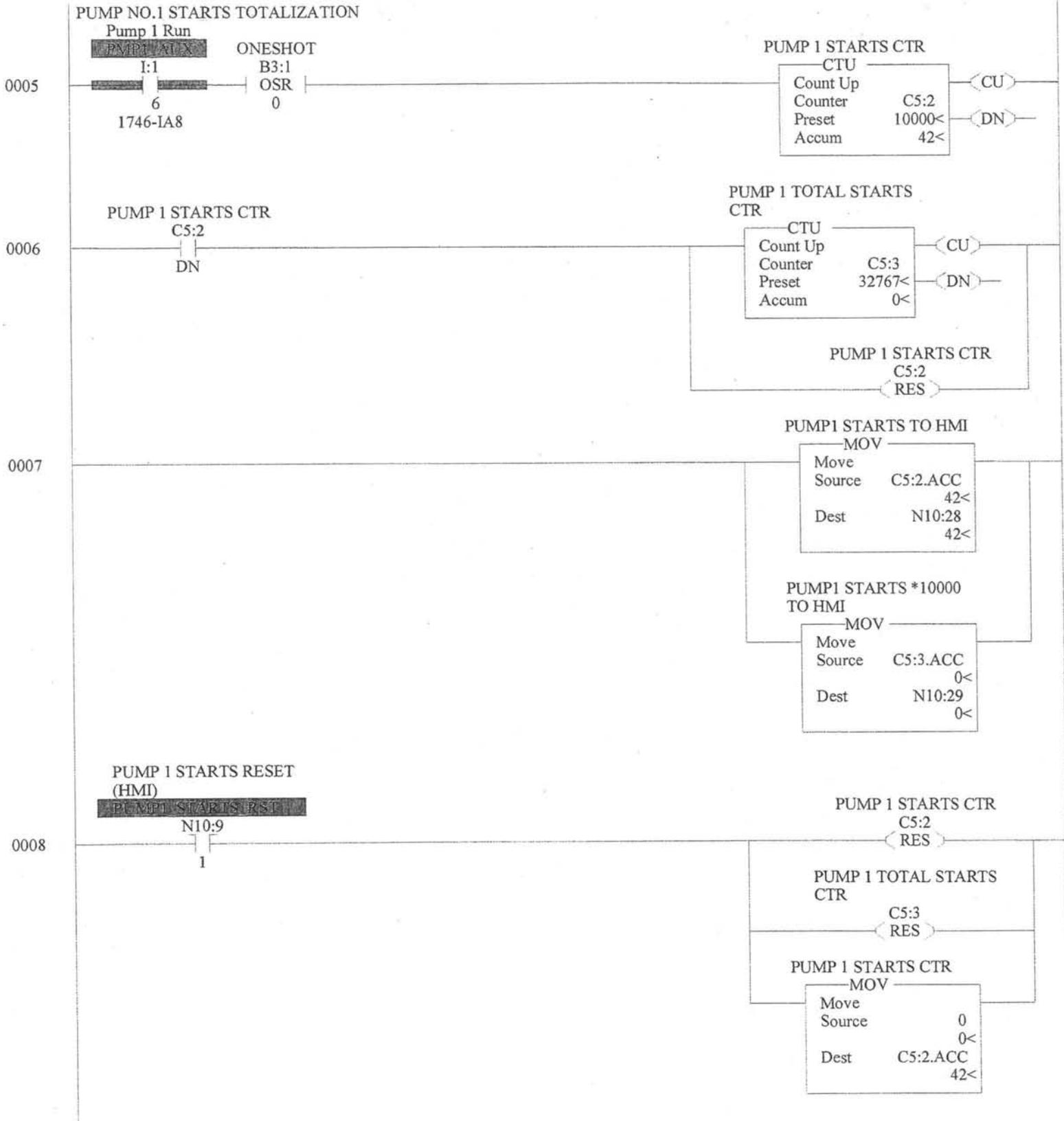


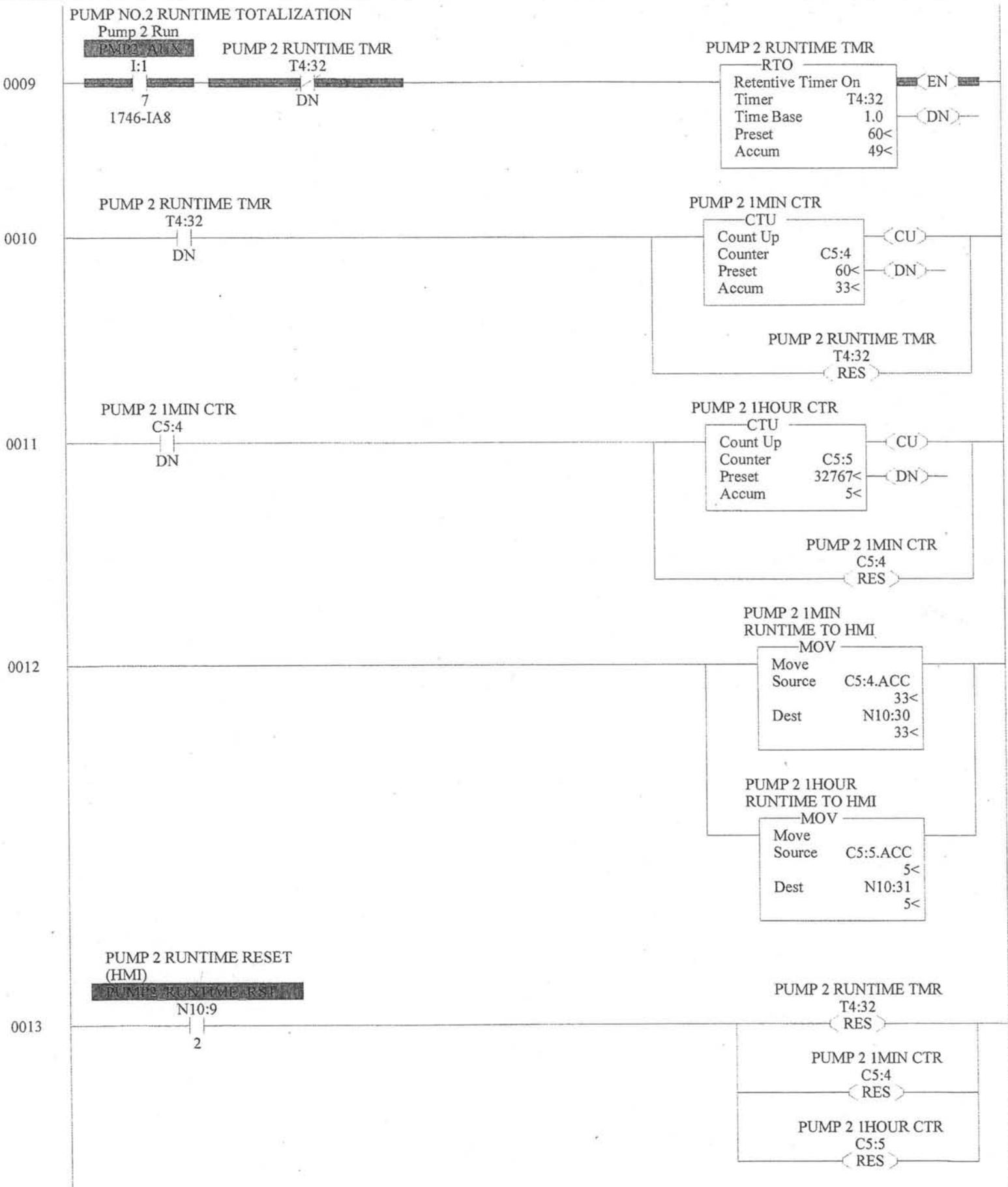


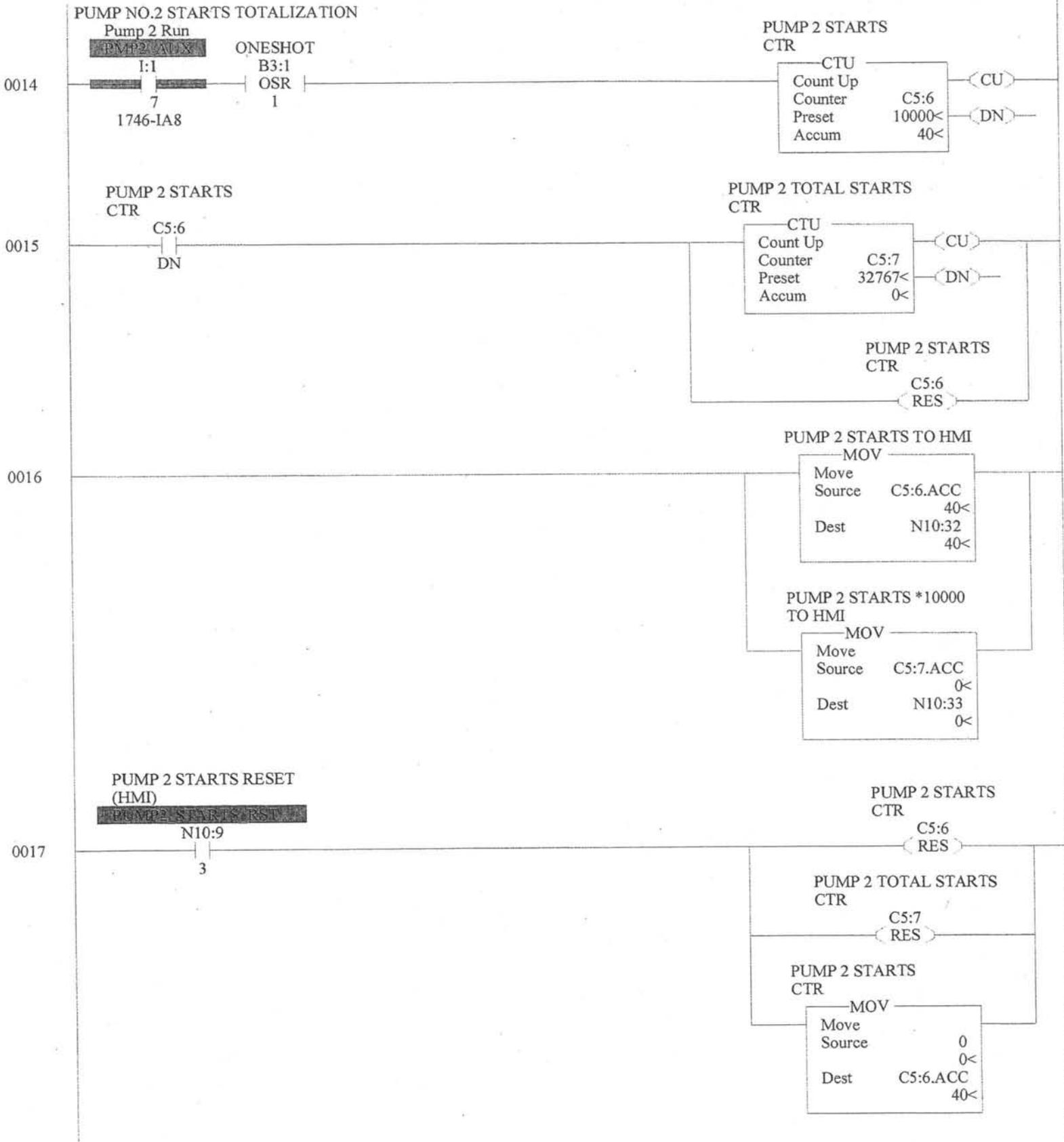


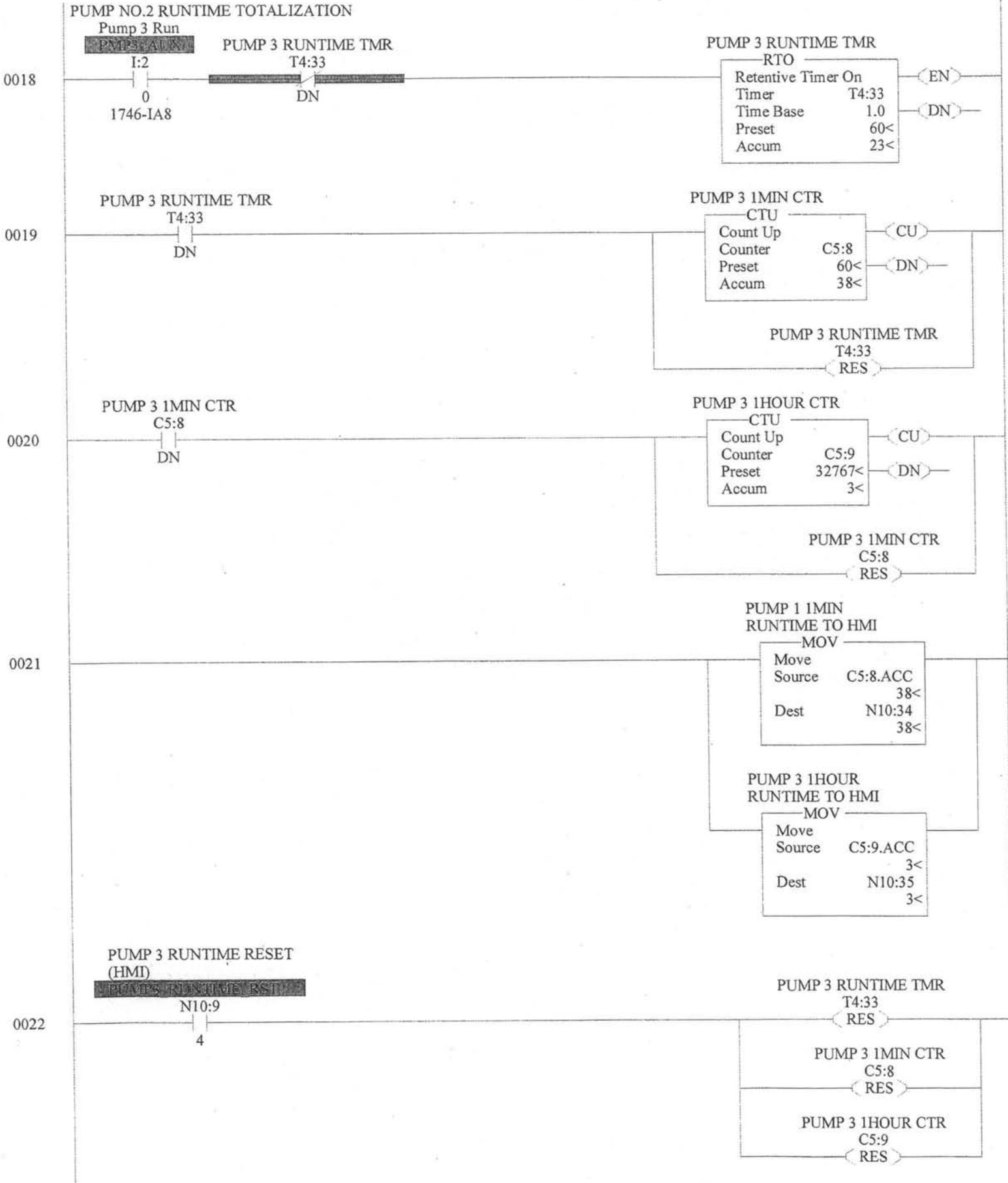


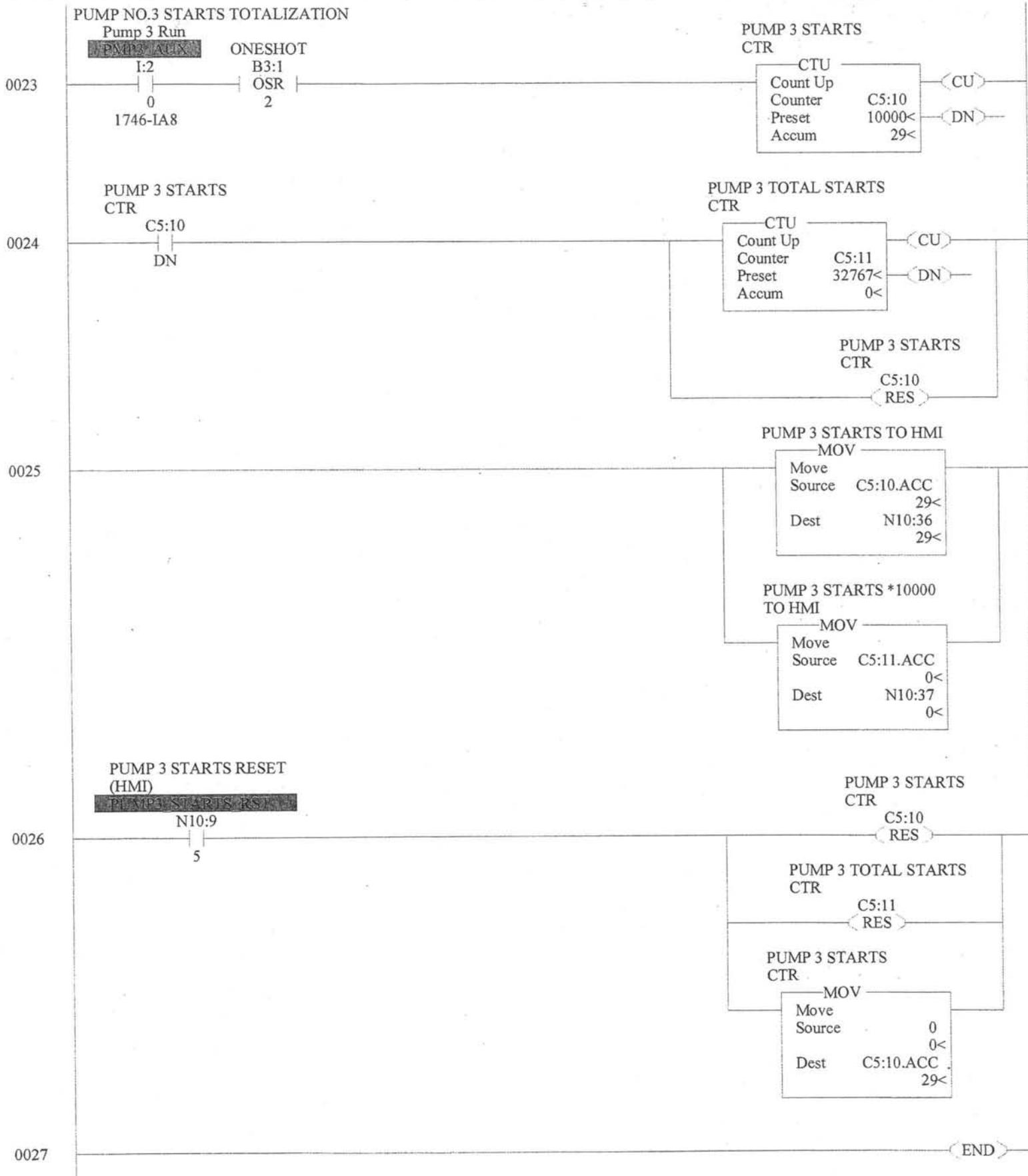












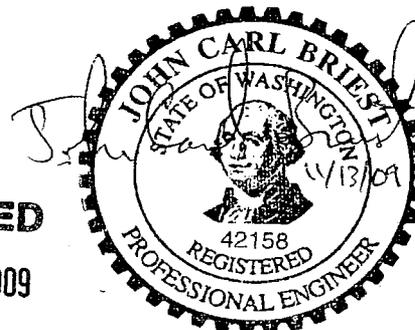
SPECIFICATION FOR

QUALITY CONTROL REQUIREMENTS

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)

CELLS 9 & 10 CONSTRUCTION

WASHINGTON CLOSURE HANFORD		JOB NO. 14655
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP		
1. <input checked="" type="checkbox"/> Work may proceed. 2. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3. <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4. <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5. <input type="checkbox"/> Permission to proceed not required.		
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.		
	CIVIL ARCHITECTURAL GEOTECHNICAL ELECTRICAL MECHANICAL PROCESS NUCLEAR CIVIL PROJECT MGR. ENVIRONMENTAL WASTE MANAGEMENT SAFETY INDUSTRIAL HYDRO AIR PROTECTION QA INSURANCE FIELD ENGINEER OTHER	
CHECK REVIEW REQUIREMENT	✓	
REVIEWED BY	BB	
W.A. Balazs Project Engineer	11-23-2009 Date	
DOCUMENT ID NUMBER		
S06X524A000N03-05-011 010		
SCP.O. No.	SSRS ITEM	SUBMITTAL



RECEIVED

NOV 19 2009

**WCH - DOCUMENT
CONTROL**

Rev.	Date	Reason for Revision	Originator	Checker	Project Engineer	LEAD Design Eng.
0	11/13/09	Issued for Award	BBM	NCI	ML	SCB
Washington Closure Hanford, LLC RIVER CORRIDOR CLOSURE CONTRACT			Job No. 14655 Specification No. 0600X-SP-G0048 Page 1 of 28 84 Pages			

DOCUMENT CONTROL
mjp 11/24/09

QUALITY CONTROL REQUIREMENTS

CONTENTS

1.0	GENERAL.....	3
1.1	SUMMARY.....	3
1.2	DEFINITIONS AND ABBREVIATIONS.....	3
1.3	REFERENCES	4
1.4	CODES, STANDARDS, LAWS, PROCEDURES, AND REGULATIONS	4
1.5	TECHNICAL SUBMITTALS.....	4
2.0	QUALITY CONTROL.....	4
2.1	GENERAL.....	5
2.1.1	Content of the CQC Plan.....	5
2.1.2	Acceptance of Quality Control Plan.....	6
2.1.3	Notification of Changes.....	6
2.2	COORDINATION MEETING.....	7
2.3	QUALITY CONTROL ORGANIZATION	7
2.3.1	CQC Organizational Staffing.....	7
2.3.2	Organizational Changes.....	7
2.4	DAILY QUALITY CONTROL (QC) REPORTS.....	7
2.5	CONSTRUCTION QUALITY CONTROL	8
2.5.1	Preparatory Phase.....	8
2.5.2	Initial Phase.....	9
2.5.3	Follow-up Phase.....	9
2.5.4	Additional Preparatory and Initial Phases.....	10
2.6	TESTS.....	10
2.6.1	Testing Laboratories	11
2.6.2	Furnishing or Transportation of Samples for Testing.....	11
2.6.3	Nuclear Densometer.....	11
2.7	COMPLETION INSPECTION	11
2.8	DOCUMENTATION	11
2.8.1	Survey	12
2.9	NOTIFICATION OF NONCOMPLIANCE	13
2.10	CONSTRUCTION QUALITY ASSURANCE PLAN COMPLIANCE.....	13
2.11	MINIMUM TESTING REQUIREMENTS.....	13
2.12	ACCEPTANCE TESTING.....	19
2.13	HOLD POINTS	19

ATTACHMENT A EXAMPLE ACCEPTANCE TEST PLAN (ATP)

QUALITY CONTROL REQUIREMENTS

1.0 GENERAL

1.1 SUMMARY

Construction Quality Control (CQC) is a planned system of inspections that is used to directly monitor and control the quality of a construction project. CQC refers to the measures taken by the SUBCONTRACTOR to determine compliance with the requirements for materials and workmanship as stated in the Drawings and Technical Specifications for the project.

1.2 DEFINITIONS AND ABBREVIATIONS

The definitions and abbreviations listed below, as used in this specification, shall have the following meaning:

ASTM	American Society for Testing and Materials
ATP	Acceptance Test Plan
CQAP	Construction Quality Assurance Plan for Environmental Restoration Disposal Facility (ERDF) Cells 9 and 10. The CQAP describes the quality assurance activities to be performed by the CQA SUBCONTRACTOR to provide assurance that the project is constructed as specified. The CQAP is to function independently of the SUBCONTRACTOR'S Quality Control Program, although the SUBCONTRACTOR shall provide assistance and cooperation, including stoppage of Work, to the CQASUBCONTRACTOR.
CQC	SUBCONTRACTOR Construction Quality Control. CQC refers to the measures taken by the SUBCONTRACTOR to determine compliance with the requirements for materials and workmanship as stated in the Drawings and Technical Specifications for the project.
DOE	U.S. Department of Energy (Hanford Site)
EPA	U.S. Environmental Protection Agency
IWCP	Integrated Work Control Program
QAP	SUBCONTRACTOR Quality Assurance Program. The QAP shall describe the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing and assessing the work. The QAP shall be prepared in accordance with Exhibits "A" and "D"
QC	Quality Control
SSRS	Subcontractor/Supplier Submittal Requirements Summary
WCH	Washington Closure Hanford, LLC

1.3 REFERENCES

DOE M 231.1-2 Occurrence Reporting and Processing of Operations Information

DOE SCRD M 231.1-2 Occurrence Reporting and Processing of Operations Information.

1.4 CODES, STANDARDS, LAWS, PROCEDURES, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Site Work. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Site Work. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ASTM D3740 Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E329 Standard Specification for Agencies Engaged in Construction Inspection and/or Testing

EPA/600/R-93/182 Quality Assurance and Quality Control for Waste Containment Facilities*

* Note that an update to EPA/600/R-93/182 has been published: Daniel, D.E. and Koerner, R. M. (2007). *Waste Containment Facilities: Guidance for Construction Quality Assurance and Construction Quality Control of Liner and Cover Systems*, second ed., ASCE, New York, NY, 351 pp.

1.5 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I," Subcontractor/Supplier Submittal Requirements Summary (SSRS). Rejected submittals shall be resubmitted to avoid delays.

2.0 QUALITY CONTROL

The SUBCONTRACTOR is responsible for quality control (QC) and shall establish and maintain an effective QC system in compliance with Exhibit "A", GC-7.20 Inspection, Quality Surveillance, and Rejection of Materials and Workmanship, GC 7.21, Testing, and GC 7.30, Quality Assurance Program, of the General Conditions, Exhibit "D", and EPA/600/R-93/182. The QC system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the contract requirements. The QC system shall cover construction operations, both on-site and off-site, and shall be keyed to the proposed construction sequence.

The SUBCONTRACTOR'S Quality Control Program shall be consistent with and be incorporated into the SUBCONTRACTOR'S Quality Assurance Program.

Rework caused by failure to follow the Quality Control system shall be at the SUBCONTRACTOR'S expense.

Additional specifications and standards for the Work are specified in other sections of the Subcontract. These additional specifications and standards are "in addition to" those specified in this section. They do not relieve SUBCONTRACTOR from compliance with the Quality Control Requirements included in this section.

2.1 GENERAL

The SUBCONTRACTOR shall furnish for review by the CONTRACTOR the SUBCONTRACTOR Construction Quality Control (CQC) Plan proposed to implement the requirements described in this specification and in Exhibit "A", GC 7.20, Exhibit "A", GC 7.21, and Exhibit "D". The CQC Plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The CONTRACTOR will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started. The CQC Plan shall be incorporated into the QAP required by Exhibit "A", GC 7.30 and Exhibit "D".

2.1.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover construction operations, both on-site and off-site, including work by subtier subcontractors.

- a. A description of the QC organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC system manager who shall report to the project manager or someone higher in the SUBCONTRACTOR's organization. Project manager in this context shall mean the individual with responsibility for the overall management of the project including quality and production.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a QC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the SUBCONTRACTOR which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager including authority to stop work which is not in compliance with the

contract. The CQC System Manager shall issue letters of direction to all other various QC representatives outlining duties, authorities and responsibilities. Copies of these letters shall also be furnished to the CONTRACTOR.

- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers and purchasing agents. These procedures shall be in accordance with Exhibit I.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be subject to approval by the CONTRACTOR.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.
- h. Reporting procedures, including proposed reporting formats.
- i. A list of the Definable Features of Work. A Definable Feature of Work is a task that is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a Definable Feature of Work, there is frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

2.1.2 Acceptance of Quality Control Plan

CONTRACTOR'S Acceptance of the SUBCONTRACTOR's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during construction. The CONTRACTOR reserves the right to require the SUBCONTRACTOR to make changes in his CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

2.1.3 Notification of Changes

After acceptance of the CQC Plan, the SUBCONTRACTOR shall notify the CONTRACTOR in writing a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the CONTRACTOR.

2.2 COORDINATION MEETING

Before start of construction, and prior to acceptance by the CONTRACTOR of the Quality Control Plan, the SUBCONTRACTOR shall meet with the CONTRACTOR or Authorized Representative and discuss the SUBCONTRACTOR's QC system. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of SUBCONTRACTOR'S management and control with the CONTRACTOR's Quality Assurance inspection and the CQA SUBCONTRACTOR. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures that may require corrective action by the SUBCONTRACTOR.

2.3 QUALITY CONTROL ORGANIZATION

The SUBCONTRACTOR shall identify an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in CQC matters for the SUBCONTRACTOR. This CQC System Manager shall be on the site during construction and shall be employed by the SUBCONTRACTOR, except as noted in the following. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the system manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

2.3.1 CQC Organizational Staffing

A CQC staff shall be maintained under the direction of the CQC System Manager to perform Quality Control activities. The actual strength of the staff during any specific work period may vary to cover work phase needs, shifts, and rates of placement. The personnel of this staff shall be fully qualified by experience and technical training to perform their assigned responsibilities and have sufficient and well-defined authority to enforce quality requirements, to identify, initiate, recommend and provide solutions to quality problems, and to verify the effectiveness of the solutions. Inspecting technicians shall meet the qualifications set forth in ASTM D3740. CQA staff shall be directly hired by and work for the SUBCONTRACTOR.

2.3.2 Organizational Changes

The SUBCONTRACTOR shall obtain CONTRACTOR's acceptance before replacing any member of the CQC staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement.

2.4 DAILY QUALITY CONTROL (QC) REPORTS

SUBCONTRACTOR shall develop a daily Quality Control (QC) Report format as part of the CQC Plan. The QC Report shall contain, at a minimum, the items listed in the paragraph, DOCUMENTATION, below. The QC Report format shall be approved by the CONTRACTOR

and shall be used by the SUBCONTRACTOR for all daily QC Reports. SUBCONTRACTOR shall summarize data from any supplemental reports by the SUBCONTRACTOR and consolidate onto the daily QC Report. The Daily QC Report shall be submitted to the CONTRACTOR in accordance with the requirements of paragraph, DOCUMENTATION, below.

2.5 CONSTRUCTION QUALITY CONTROL

Construction Quality Control is the means by which the SUBCONTRACTOR ensures that construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The controls shall be adequate to cover construction operations, and shall be keyed to the proposed construction sequence. At least three phases of control shall be conducted by the CQC system manager for all Definable Features of Work, as follows:

2.5.1 Preparatory Phase

This phase shall be performed prior to beginning work on each Definable Feature of Work and shall include:

- a. A review of each paragraph of applicable specifications.
- b. A review of the contract plans.
- c. A check to assure that materials and equipment have been tested, submitted, and approved.
- d. A check to assure that provisions have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawing or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis, work control package(s), and procedure(s) to assure safety and quality requirements are met.
- h. Discussion of procedures for constructing the work including lessons learned. Document construction tolerances and workmanship standards for that phase of work.
- i. A check to ensure that the portion of the plan and suppliers for the work to be performed has been accepted by the CONTRACTOR.

- j. The CONTRACTOR shall be notified at least 24 hours in advance of beginning the preparatory phase. This phase shall include a meeting conducted by the CQC system manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC system manager and attached to the daily QC report. The SUBCONTRACTOR shall instruct and train applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

2.5.2 Initial Phase

This phase shall be accomplished at the beginning of a Definable Feature of Work. The following shall be accomplished:

- a. A check of preliminary work to ensure that it is in compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verification of full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship, qualification, and training and verify that it meets minimum acceptable workmanship standards. Compare with sample panels if appropriate.
- d. Resolve differences.
- e. Check safety to include compliance with and upgrading of the safety plan, activity hazard analysis work control package(s), and procedure(s) to assure safety and quality. Review with each worker.
- f. The CONTRACTOR shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC system manager and attached to the daily QC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase shall be repeated for each new crew to work on-site, or any time acceptable specified quality standards are not being met.

2.5.3 Follow-up Phase

Daily inspections shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The inspections shall be documented in accordance with the. Final follow-up inspections shall be

conducted and deficiencies corrected prior CQC to the start or completion of work that may be affected by the deficient work. The SUBCONTRACTOR shall not build upon or conceal non-conforming work.

2.5.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same Definable Features of Work as determined by the CONTRACTOR if the quality of on-going work is unacceptable; or if there are changes in the applicable QC staff or in the on-site production supervision or work crew; or if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

2.6 TESTS

The SUBCONTRACTOR shall perform tests specified or required to verify that control measures are adequate to provide a product that conforms to contract requirements. Testing includes operation, in process, verification and acceptance tests when required/specified. Testing shall be performed in accordance with Exhibit "A", GC 7.21. The SUBCONTRACTOR shall procure the services of a CONTRACTOR-approved testing laboratory or establish an approved testing laboratory at the project site. A list of tests to be performed shall be furnished as part of the CQC plan. The list shall give the test name, frequency, specification paragraph containing the test requirements, work implementing document (procedure, work package, etc.) quality control required for, the personnel and laboratory responsible for each type of test and estimate of the number of tests required. The SUBCONTRACTOR shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements
- b. Verify that facilities and testing equipment are available and comply with testing standards
- c. Check test instrument calibration data against certified standards
- d. Verify that recording forms and test identification control number system, including the test documentation requirements, have been prepared.
- e. Results of tests taken, whether passing or failing, and retests, shall be recorded on the QC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be recorded. Actual test reports may be submitted later, if approved by the CONTRACTOR, with a reference to the test number and date taken. An information copy of tests performed by an off-site or commercial test facility shall be provided directly to the CONTRACTOR. Failure to submit test reports, as stated, may result in nonpayment for related work performed, rework, and disapproval of the test facility for this contract.

2.6.1 Testing Laboratories

The CONTRACTOR reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt and steel shall meet criteria detailed in American Society for Testing and Materials (ASTM) D3740 and E329. Laboratories used for geosynthetics shall be accredited by the Geosynthetics Accreditation Institute – Lab Accreditation Program (GAI-LAP) for each test procedure.

The CONTRACTOR reserves the right to utilize the SUBCONTRACTOR's control testing laboratory and equipment to make assurance tests and to check the SUBCONTRACTOR's testing procedures, techniques, and test results at no additional cost to the CONTRACTOR.

2.6.2 Furnishing or Transportation of Samples for Testing

Costs for the transportation of samples or materials shall be borne by the SUBCONTRACTOR. Samples of materials for test verification and acceptance testing by the CONTRACTOR shall be delivered to the CONTRACTOR's Representative.

2.6.3 Nuclear Densometer

SUBCONTRACTOR's nuclear densometer used for compaction testing shall meet the requirements specified in Exhibit "G" Section 4.3.03.

2.7 COMPLETION INSPECTION

At the completion of work or any increment thereof established by a completion time stated in Exhibit "B", SC 4.4 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, or stated elsewhere in the specifications, the CQC system manager shall conduct an inspection of the work and develop a 'punch list' of items which do not conform to the approved plans and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC system manager or staff shall make a second inspection to ascertain that deficiencies have been corrected and so notify the CONTRACTOR. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

2.8 DOCUMENTATION

The SUBCONTRACTOR shall maintain current records of QC operations, activities, and tests performed, including the work of subcontractors and suppliers. These records shall be documented on a daily report (form acceptable to the CONTRACTOR) and shall include factual

evidence that required QC activities and tests have been performed, including but not limited to the following:

- a. SUBCONTRACTOR and Suppliers and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Test and control activities performed with results and references to specifications/plan requirements. The control phase should be identified (Preparatory, Initial, and Follow-up). List deficiencies noted along with corrective action.
- d. Off-site surveillance activities, including actions taken.
- e. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- f. List instructions given/received and conflicts in plans and specifications.
- g. SUBCONTRACTOR's verification statement.
- h. Work performed today, giving location, description, and by whom.
- i. Material received with statement as to its acceptability and storage.
- j. Identify submittals reviewed, with contract reference, by whom, and action taken.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the CONTRACTOR the next work day. As a minimum, one report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. Calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC system manager. The report from the CQC system manager shall include copies of test reports and copies of reports prepared by subordinate QC personnel.

2.8.1 Survey

The SUBCONTRACTOR shall provide as-built survey data as specified in Exhibit "B" SC 4.3 and Exhibit "D".

The CQA SUBCONTRACTOR will perform surveys to verify SUBCONTRACTOR's work and liner system thicknesses. SUBCONTRACTOR shall provide CQA SUBCONTRACTOR 48 hours notice for mobilization for this survey.

2.9 NOTIFICATION OF NONCOMPLIANCE

The CONTRACTOR will notify the SUBCONTRACTOR of any detected noncompliance. The SUBCONTRACTOR shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the SUBCONTRACTOR at the site of the work, shall be deemed sufficient for the purpose of notification. If the SUBCONTRACTOR fails or refuses to comply promptly, the CONTRACTOR may issue an order stopping the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the SUBCONTRACTOR.

2.10 CONSTRUCTION QUALITY ASSURANCE PLAN COMPLIANCE

The CONTRACTOR will contract with an independent construction quality assurance subcontractor (CQA Subcontractor), who will utilize the CQAP to assure the following:

1. Facility components are constructed in accordance with the plans and specifications.
2. The requirements are documented sufficiently to demonstrate compliance with CONTRACTOR regulations.

SUBCONTRACTOR shall assist the CONTRACTOR's independent CQA Subcontractor by providing documentation, records, material, equipment, and labor as required to demonstrate that the facility construction is acceptable in accordance with the Technical Specifications. When tests or documentation activities are required to be performed by the independent CQA Subcontractor, the SUBCONTRACTOR shall stop work on those areas until authorized to proceed. In the event material tests fail, the SUBCONTRACTOR shall bring the material into compliance with the plans and specifications and support additional testing as required.

2.11 MINIMUM TESTING REQUIREMENTS

All materials, products and components manufactured, procured or fabricated by SUBCONTRACTOR as part of the Work shall be subjected to such workmanship, tests, inspections, surveillance, supervision, and control as may be necessary to verify compliance with the requirements of the Subcontract Documents. This paragraph lists the minimum testing requirements for the major construction components. Additional quality control requirements for the Work are specified in other sections of the Subcontract. These additional specifications and standards are "in addition to" those specified in this paragraph. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in the applicable Specification for the feature of work.

Sitework (0600X-SP-C0075)

Phase	Material	Test and ASTM Number	Frequency
Construction	Waste Trench Subgrade	In-Place Density (D6938)	1 per 10,000 ft ²
	Roadways- Subgrade, Base and Surface Materials	In-Place Density (D6938)	Two tests every 200 ft, one at centerline, and one at roadway shoulder
	Structural Fill & Waste Trench Embankment	In-Place Density (D6938)	1 per 10,000 ft ² per lift
	Below Crest Pad Bldgs	In-Place Density (D6938)	2 per lift
	Utility Systems- Trench Backfill and Final Backfill	In-Place Density (D6938)	1 per lift for every 300 ft of installation
	General Fills	In-Place Density (D6938)	1 per 20,000 ft ² per lift
	Termination Berms	In-Place Density (D6938)	1 per 300 ft
	Riser Pipe Trench Backfill	In-Place Density (D6938)	1 per 100 ft per lift

Admix Soil Liner (0600X-SP-C0076)

Phase	Material	Test and ASTM Number	Frequency
Pre-construction ⁽¹⁾	Bentonite	Manufacturer's Certificates	1 per 500 tons delivered
Test Fill	Admix	Visual Observation	Continuous
		Maximum Clod Size	Periodic Visual Monitoring
		Belt Scale Measurements	1 per 5,000 yd ³
Construction	Admix	Maximum Clod Size	Periodic Visual Monitoring
		Belt Scale Measurements	1 per 5,000 yd ³

(1) Trench subgrade testing referenced in Sitework (0600X-SP-C0075) table above.

Gravel Drainage Layers (0600X-SP-C0078)

Phase	Material	Test and ASTM Number	Frequency
Construction	Gravel, when delivered	Visual Observation	Continuous
		Carbonate Content (D4373-02)	1 per 10,000 yd ³
		Grain Size Distribution (C136)	1 per 2,000 yd ³
		Permeability (D2434)	1 per 2,000 yd ³
		In Place Density (D6938) ⁽¹⁾	1 per 2,000 yd ³

(1) Type C material only.

Operations Layer (0600X-SP-C0078)

Phase	Material	Test and ASTM Number	Frequency
Construction		Visual Observations	Continuous
		In-Place Density (D6938)	1 per 20,000 ft ²

Anchor Trench/Side Slope Riser Pipe Trench (0600X-SP-C0077 and 0600X-SP-C0075)

Phase	Material	Test and ASTM Number	Frequency
Pre-Construction	Prior to backfilling	Visual Observation	Continuous
Construction ⁽¹⁾		Visual Observations	Periodic

(1) Density testing requirements provided in Sitework (0600X-SP-C0075) table above.

HDPE Geomembrane (0600X-SP-C0077)

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Resin	Manufacturer's Documentation Certification and QC Test Results	Every Lot
	Geomembrane	Manufacturer's Documentation, Certification and QC Test Results	Every Roll
Pre-Construction (Before Installing) (Note 1)	Geomembrane	Receiving Inspection	Every Roll
		Friction Angle (Direct Shear – D5321) Textured HDPE Liner vs. Admix Liner	2 Tests Total
	Extrudate	Documentation and Certification	Every Resin Lot
	Installation Surface	Installer's Certification of a Suitable Installation Surface	Each Installation Surface
Construction	Geomembrane	Seam Overlap	Every Panel
		Trial Seams	Every 4 Hours per Welder per Machine
		Vacuum Test ASTM (D5641)	All Extrusion or Single Wedge Fusion Welds
		Air Pressure Test ASTM (D5820)	All Double Wedge Fusion Welds
		Seam Destructive Test (D6392) 5 Peel/5 Shear	Min. Avg. of 1 per 500 ft per Welder

(1) Testing may be performed prior to shipment from factory or after delivery at site.

Geotextile (0600X-SP-C0077)

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geotextile and Thread	Manufacturer's Documentation, Certification, and QC Test Results (except UV Resistance)	Every 50,000 ft ² per Lot
	Geotextile	UV Resistance QC Test Results	Annually for each Geotextile Formulation used on the project
Pre-Construction (Before Installing) (Note 1)	Geotextile	Receiving Inspection	Every Roll

(1) Testing may be performed prior to shipment from factory or after delivery at site.

Geocomposite (0600X-SP-C0077)

Phase	Material	Test and ASTM Number	Frequency
Pre-Fabrication (Before Bonding Geotextile to Geonet)	Geonet and Geotextile Components	Manufacturer's Documentation, Certification and QC Tests	Every 50,000 ft ² per Lot
		Passing Conformance Test Results for both the Geonet and the Geotextile	
Pre-Shipment (After Bonding, Before Shipping)	Geocomposite	Manufacturer's Documentation, Certification and QC Test Results	
Pre- Construction (Note 1)	Geocomposite	Receiving Inspection	Every Roll
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Textured HDPE Liner	2 Tests Total
		Friction Angle (Direct Shear - D5321) Geocomposite vs. Operations Layer	2 Tests Total

(1) Testing may be performed prior to shipment from factory or after delivery at site.

Geonet (0600X-SP-C0077)

Phase	Material	Test and ASTM Number	Frequency
Pre-Shipment (Before Shipping)	Geonet	Manufacturer's Documentation Certification and QC Tests	Every 50,000 ft ² per Lot
Pre- Construction (Before Installing) (Note 1)	Geonet	Receiving Inspection	Every Roll

(1) Testing may be performed prior to shipment from factory or after delivery at site.

Reinforced Concrete minimum testing requirements are described in Specification No. 0600X-SP-C0079. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in Specification No. 0600X-SP-C0079.

Crest Pad Building minimum testing requirements are described in Specification No. 0600X-SP-C0080. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in Specification No. 0600X-SP-C0080.

Metals minimum testing requirements are described in Specification No. 0600X-SP-C0081. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in Specification No. 0600X-SP-C0081.

Coatings and Finishes minimum testing requirements are described in Specification No. 0600X-SP-A0025. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in Specification No. 0600X-SP-A0025.

Electrical Work minimum testing requirements are described in Specification No. 0600X-SP-E0025 and in section titled ACCEPTANCE TESTING below. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in Specification No. 0600X-SP-E0025.

Pipes, Valves, and Specials minimum testing requirements are described in Specification No. 0600X-SP-M0032 and in section titled ACCEPTANCE TESTING below. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in Specification No. 0600X-SP-M0032.

Leachate Pump minimum testing requirements are described in Specification No. 0600X-SP-M0033 and in section titled ACCEPTANCE TESTING below. The SUBCONTRACTOR shall maintain records of his quality control for operations as described in section titled CONSTRUCTION QUALITY CONTROL in Specification No. 0600X-SP-M0033.

2.12 ACCEPTANCE TESTING

The SUBCONTRACTOR shall perform acceptance testing in accordance with Exhibit "D".

An example Acceptance Test Plan (ATP) is attached to this section. This ATP has been prepared to provide an example of the field testing procedures to demonstrate that the Electrical/Instrumentation and Piping/Mechanical systems for the Disposal Trench and Support Facilities function as intended by the design.

2.13 HOLD POINTS

Hold points are established for certain key activities as identified in the following table. At these points, the SUBCONTRACTOR shall cease work on the affected activity until it has been reviewed by the CONTRACTOR and/or CQA Subcontractor. SUBCONTRACTOR shall provide the CONTRACTOR and CQA Subcontractor at least one week notice prior to a hold point inspection.

ERDF CONSTRUCTION HOLD POINTS

Phase	Activity	Hold Point	Needed to Proceed
Excavation	Subgrade for Liner	Before Covering Subject Portion with Next Layer	Passing CQA density tests
			CQA subgrade survey completed
Soil Liner	Admix Placement	Before Placing in Cell	Passing CQA tests for test fill and stockpiled admix
	Final Surface	Before Covering with HDPE Liner	Passing CQA tests and observation requirements
CQA surveys to verify final soil liner thickness			
HDPE Liner	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
			Acceptable SUBCONTRACTOR and CQA Friction Angle tests
		Before Covering Subject Portion with Next Layer	CQA review of SUBCONTRACTOR's installation records
			Passing CQA tests
			CQA visual inspection of panels, seams, penetrations, and repairs
		CQA surveys of seams, penetrations, and repairs	
Geotextile	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
		Before covering subject Portion with Next Layer	CQA visual inspection of panels, seams, penetrations, and repairs
Geocomposite	Delivery	Before Shipping	Manufacturer's documentation
	Installation	Before Installing	Passing CQA conformance tests
			Acceptable SUBCONTRACTOR and CQA Friction Angle tests
		Before Covering Subject Portion with Next Layer	CQA visual inspection of panels, seams, penetrations, and repairs
Drainage Gravel	Installation	Before Covering subject Portion with Next Layer	Passing CQA tests
			CQA surveys to verify layer thickness
Operations Layer	Installation	After Installing	Passing CQA tests
			CQA surveys to verify layer thickness
Piping	Installation	Before Backfilling Trenches	Passing CQA Receipt Inspections
			Passing Pressure and Leak Test Results

ATTACHMENT A
EXAMPLE ACCEPTANCE TEST PLAN (ATP)

13 Pages attached

**ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
ERDF CELLS 7 and 8**

**HANFORD SITE
RICHLAND, WASHINGTON**

ACCEPTANCE TEST PROCEDURE

WASHINGTON CLOSURE HANFORD											JOB NO. 14655				
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP															
<p>1 <input checked="" type="checkbox"/> Work may proceed.</p> <p>2 <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission.</p> <p>3 <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments.</p> <p>4 <input type="checkbox"/> Revise and resubmit. Work may not proceed.</p> <p>5 <input type="checkbox"/> Permission to proceed not required.</p> <p>Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.</p>															
	CIVIL STRUCTURAL/ GEOTECHNICAL	ELECTRICAL	MECHANICAL	PROCESS/ NUCLEAR	CADD	PROJECT REP.	ENVIRONMENTAL	WASTE MANAGEMENT	SAFETY	INDUSTRIAL HYGIENE	HAZARDOUS WASTE PROTECTION	QA	QA/QC	FIELD ENGINEER	OTHER
CHECK REVIEW REQUIREMENT	<input checked="" type="checkbox"/>											<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
REVIEWED BY	BB											PE	3/20/09		
	B. Brown											3/26/09	via email		
	Project Engineer/STR											Date			
	DOCUMENT ID NUMBER														
	S06X533A00 05-007 001														
	SCI/P.O. No.											SSRS ITEM	SUBMITTAL		

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MAR 02 2009

**WCH - DOCUMENT
CONTROL**

CONTENTS

PURPOSE OF THE ACCEPTANCE TEST	2
1.0 REFERENCE DRAWINGS AND SPECIFICATIONS.....	2
1.1 DRAWINGS – See Exhibit F	2
1.2 SPECIFICATIONS	2
2.0 RESPONSIBILITIES	2
2.1 (CONTRACTOR) WASHINGTON Closure Hanford (WCH).....	2
2.2 TEST DIRECTOR	2
2.3 WITNESSES	2
2.4 RECORDER	2
2.5 CONSTRUCTION SUBCONTRACTOR.....	2
2.6 OCCUPATIONAL SAFETY AND HEALTH.....	2
3.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL	2
4.0 RECORDING AND RESOLVING EXCEPTIONS	2
4.1 GENERAL.....	2
4.2 RECORDING	2
5.0 TEST CONDITIONS AND EQUIPMENT REQUIRED.....	2
5.1 GENERAL.....	2
5.2 EQUIPMENT REQUIRED	2
6.0 TRANSDUCERS AND METER/CONTROLLERS IN LANDFILL SUMPS.....	2
7.0 LEACHATE PUMP TESTS.....	2
7.1 CONDITIONS FOR PUMP TESTS.....	2
7.2 LEACHATE PUMPS	2
8.0 LEACHATE STORAGE AND TRANSFER SYSTEM.....	2
8.1 MANHOLE FLOOD ALARM.....	2
8.2 Leachate Tank High Level.....	2

APPENDIX A - EXCEPTION FORM
APPENDIX B - TEST EXECUTION FORM

ACCEPTANCE TEST PROCEDURE

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY

PURPOSE OF THE ACCEPTANCE TEST

This acceptance test procedure (ATP) has been prepared to establish field testing procedures to demonstrate that the Electrical/Instrumentation and Piping/Mechanical systems for the Disposal Trench and Support Facilities function as intended by the design.

1.0 REFERENCE DRAWINGS AND SPECIFICATIONS

1.1 DRAWINGS – SEE EXHIBIT F

1.2 SPECIFICATIONS

<u>Specification Number</u>	<u>Specification Title</u>
0600X-SP-G0037	Quality Control Requirements
0600X-SP-G0038	Supplier Quality Assurance Program Requirements
0600X-SP-A0024	Coatings & Finishes
0600X-SP-C0067	Cell Construction - Admix Layer
0600X-SP-C0068	Cell Construction - Geosynthetics
0600X-SP-C0069	Cell Construction - Leachate Collection Systems and Lysimeters
0600X-SP-C0070	Reinforced Concrete
0600X-SP-C0071	The Crest Pad Building
0600X-SP-C0072	Site Work
0600X-SP-C0073	Metal Structures
0600X-SP-E0024	Electrical Work
0600X-SP-M0029	Pipe, Valves & Specials
0600X-SP-M0030	Leachate Pumps
0000X-SP-C0007	Civil Surveying Services

2.0 RESPONSIBILITIES

Each company or organization participating in the conduct of this ATP will designate personnel to assume the responsibilities and duties as defined herein for their respective roles. The names of these designees shall be provided to the Recorder for listing on the Recorder's copy of the Test Execution Sheet prior to the performance of any part of this ATP.

2.1 (CONTRACTOR) WASHINGTON CLOSURE HANFORD (WCH)

- Designate a Test Director.
- Act as liaison between the participants in acceptance testing.
- Establish and distribute the testing schedule.
- Schedule and conduct a pre-ATP meeting with test participants prior to start of testing.
- Notify all persons performing and witnessing the test prior to the start of testing.
- Notify all concerned parties when a change is made in the testing schedule.
- Sign Test Execution Sheet when ATP is approved and accepted.
- Take necessary action to clear exceptions to the ATP.
- Sign Exception Sheet when exception has been resolved.
- Provide a distribution list for the approved and accepted ATP.

2.2 TEST DIRECTOR

- Coordinate acceptance testing.
- Distribute documents including completed ATP, exceptions, resolutions and approvals.
- Confirm that field testing and inspection of the system or portion of the system to be tested has been completed.
- Stop any test which, in the judgment of the Director, may cause damage to the system until the test procedure has been revised.
- Obtain revisions to the ATP, as necessary, to comply with authorized field changes or to accommodate existing field conditions.
- Evaluate recorded data, discrepancies, and exceptions.
- Obtain from the CONTRACTOR any information related to this ATP or changes necessary to clear or resolve objections.
- Sign Test Execution Sheet when ATP has been completed.

- Sign Exception Sheet when retest has been executed and accepted.

2.3 WITNESSES

Witnesses shall be provided as directed by the CONTRACTOR.

- Witness the tests.
- Evaluate results of testing.
- Assist the Test Director when requested.
- Sign Test Execution Sheet as a Witness.
- Sign Exception Sheet as a Witness when retest has been executed and accepted.

2.4 RECORDER

The Recorder will be provided by the WCH subcontracted Quality Assurance Engineer.

- Prepare Test Data Forms to record ATP data and observations (see Attachments A and B).
- Record names of all designated personnel on Recorder's copy of ATP prior to start of testing.
- Observe tests and record test data.
- Sign the Test Execution Sheet as the Recorder.
- On the Exception Sheet, record objections or exceptions and test activities which are not performed.
- Orally notify the Test Director at the time an objection is made.
- Assign page numbers to all test data sheets and Exception Sheets, after ATP is complete. Submit the completed ATP documents to the CONTRACTOR.

2.5 CONSTRUCTION SUBCONTRACTOR

- Organize and perform this acceptance test under coordination of the Test Director.
- Confirm that all equipment required for performing this test will be available at the start of testing.

- Provide equipment required for performing this acceptance test, unless designated by these procedures as being supplied by others.
- Provide lock and tag materials and personnel to perform ATP.
- Request in writing from the CONTRACTOR those services, materials, or equipment that have been designated as being supplied by the CONTRACTOR or others.
- Sign the Test Execution Sheet when the ATP has been completed.
- Sign the Exception Sheet when the retest has been completed and accepted.

2.6 OCCUPATIONAL SAFETY AND HEALTH

Individuals shall carry out their assigned work in a safe manner to protect themselves and others from undue hazards and to prevent damage to property and environment. Performance of test activities shall always include safety and health aspects as delineated in the most current version of the Federal Occupational Safety and Health Administration/Washington Industrial Safety and Health Act (OSHA/WISHA) safety health codes and standards.

3.0 ACCEPTANCE TEST PROCEDURE CHANGE CONTROL

Acceptance testing shall be conducted in accordance with the steps and requirements specified in this procedure. Any required changes must be authorized in accordance with approved change control procedures for this project and promptly accomplished. Procedure changes during testing must be approved by the CONTRACTOR, quality assurance, and the subcontracted quality assurance engineer (via initials). The recorder shall note these changes as exceptions (see Section 5.2), provided that these changes do not affect safety and health. The changes shall be noted in the final acceptance test report.

4.0 RECORDING AND RESOLVING EXCEPTIONS

4.1 GENERAL

Exceptions to the ATP are sequentially numbered and recorded on individual Exception Sheets. This enables case-by-case resolution, recording, approval, and distribution of each exception.

4.2 RECORDING

- Number each exception sequentially as it occurs and record it on an Exception Sheet.
- Enter name and organization of objecting party for each exception.
- Describe the exception.

- Record the action taken to resolve each exception. Include test results as applicable. Repeat the process as necessary until exception has been resolved.
- When action taken results in an acceptable retest, sign and date the Exception Sheet.

5.0 TEST CONDITIONS AND EQUIPMENT REQUIRED

5.1 GENERAL

The following conditions shall exist at the start of the acceptance testing for that portion of the system being tested.

- Systems being tested have been inspected for workmanship and for compliance with design.
- Continuity tests have been performed on portions of the electrical system being tested.
- Power is available to components of systems being tested.
- Continuity tests of instrumentation wiring have been performed in accordance with the latest revision of the construction Specifications.
- All test instruments have a valid calibration stamp attached that indicates a calibration traceable to the National Institute of Standards and Technology.
- Personnel responsible for directing, witnessing and performing the tests described in this ATP are familiar with the equipment to be tested, have reviewed the vendor information pertaining to the operation of the equipment, and are familiar with the requirements of this acceptance test procedure.
- Values used to simulate process inputs (such as water levels D1, D2, D3, D4, etc. - See Figure 1) and alarm conditions for execution of ATP have been provided.

5.2 EQUIPMENT REQUIRED

The Construction SUBCONTRACTOR shall supply all test equipment unless otherwise noted. Test equipment shall include electrical equipment, pressure gages, tapes or rods, and other measuring apparatus to perform the acceptance tests. Test equipment shall have suitable range and accuracy for the parameter being measured. All ancillary equipment such as jumpers, valves, piping, and similar items shall also be provided by the Construction SUBCONTRACTOR. All test equipment shall be approved by the Test Director prior to use.

6.0 TRANSDUCERS AND METER/CONTROLLERS IN LANDFILL SUMPS

This procedure will demonstrate the correct functioning of the level transducers and the associated meter/controllers. See Figure 1 for definitions of water levels and associated pumps and relays. Verify that the level transducers have been calibrated prior to installation.

- Pump the primary sump to below the low water level D1, Remove power to the pump in the sumps by opening the associated circuit breakers.
- Verify that the relays associated with the high water levels (D2 and D4) in the primary sump are “off” (de-energized) and the relay associated with the low water levels (D1 and D3) in the primary sump are “on” (energized).
- Add water in increments as directed by the Test Director to primary sump via the slope riser pipe. Record the volume of water added to the sump. Wait 2 minutes after each increment of water, and record the primary sump level meter reading. Verify that the primary sump level meter reading increases as water is added.
- Continue adding water in increments and observe that the low water level relay is de-energized when the level is above D1 (low capacity pumps – Pumps 2 and 3) and D3 (high capacity pumps – Pump 1) and that the high water level relay is energized when the level is above D2 (low capacity pumps – Pumps 2 and 3) and D4 (high capacity pumps – Pump 1) .

7.0 LEACHATE PUMP TESTS

This procedure will demonstrate the correct functioning of the high capacity (Pump 1) and low capacity (Pumps 2 and 3) leachate pumps and associated controls. See Figure 1 for definitions of water levels and associated pumps. For each of the leachate pumps, measure the phase currents prior to beginning pumping tests. Record this information on the top of the appropriate test data forms. Verify that motor overload devices are sized correctly.

7.1 CONDITIONS FOR PUMP TESTS

Prior to testing pumps, verify that the relay associated with the high water levels for the leachate storage tanks is de-energized, that the valves in the manholes for the leachate piping system are open, and that any water in the manholes is below the flood switches.

This testing should begin with water in the primary sump above level D4 and above DS-2 in the secondary sump. Verify the following conditions on the control panel:

- High water level relays are energized.
- Low water level relays are de-energized.

- Pump failure lights for the primary low capacity and high capacity submersible pumps are on.
- The roof alarm light is on.
- The panel lights associated with the high water relays are on, and the panel lights associated with the low water relays are off.

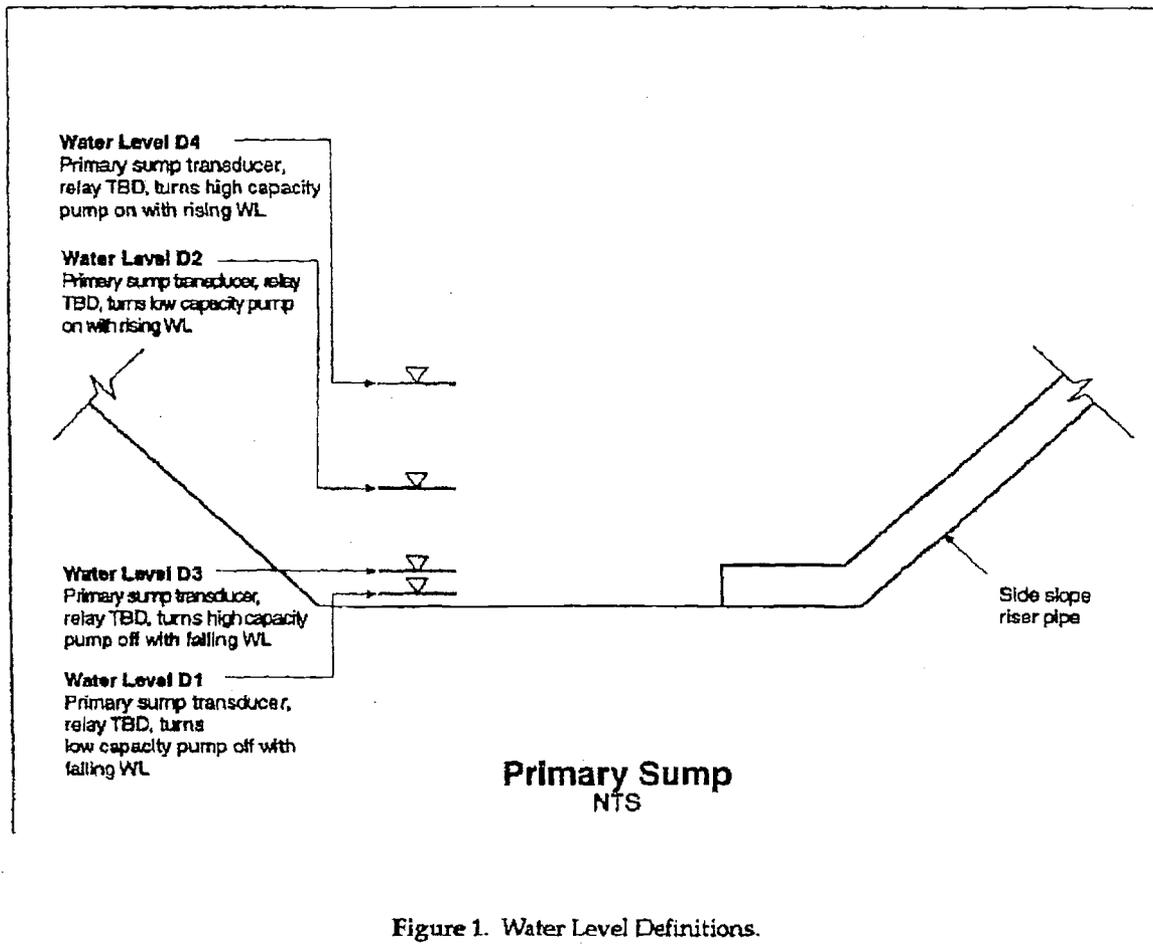


Figure 1. Water Level Definitions.

Secondary Sump: DS-1 (same as Water Level D1 on Figure 1), DS-2 (same as Water Level D2 on Figure 1)

7.2 LEACHATE PUMPS

Demonstrate that the pumps meet the operational criteria listed:

- Turn the switch for the low capacity pump to the “hand” position. Verify by observation (sight, sound, pipe vibrations, and/or transducer readings) that water is being pumped from the sump, and verify that the associated “pump run” light is on.

- Turn the switch for the high capacity pump to the “hand” position. Verify by observation (sight, sound, pipe vibrations, and/or transducer readings) that water is being pumped from the sump, and verify that the associated “pump run” light is on.
- Turn the primary leachate pump switches on the motor controller to “automatic” position.
- Verify that the low capacity pump starts automatically and that the pump run light is on. Verify by observation that water is being pumped from the sump. Allow the pump to continue running in the “automatic” mode.
- Verify that the high capacity pump starts automatically and that the pump run light is on. Verify by observation that water is being pumped from the sump. Continue pumping the high capacity pump in the automatic mode.
- While the pumps are running, simulate a high water level in the storage tanks. Verify that the pumps are automatically stopped and that the roof alarm is initiated.
- Verify that when the water level in the sump reaches level D3 (Primary Sump) the high capacity pump (PUMP 1) automatically shuts off.
- Verify that when the water level in the sump reaches level D1 (Primary Sump) or DS-1 (Secondary Sump) the low capacity pumps (PUMP 2 and 3) automatically shut off.

8.0 LEACHATE STORAGE AND TRANSFER SYSTEM

8.1 MANHOLE FLOOD ALARM

Demonstrate that when activated, the alarm switch will shut-off the pumps in the associated crest pad building.

8.2 LEACHATE TANK HIGH LEVEL

Demonstrate that when activated, the alarm switch will shut-off the pumps in the associated crest pad building.

ATTACHMENT A
EXCEPTION FORM

EXCEPTION FORM

EXCEPTION NUMBER. _____ SHEET _____ OF _____

DATE _____

EXCEPTIONS BY:

NAME _____

ORGANIZATION _____

DESCRIPTION: _____

ACTION TAKEN: _____

APPROVED:

WCH Construction Manager

Date

Test Director

Date

Witness Name / Organization

Date

Witness Name / Organization

Date

Construction Subcontractor / Organization

Date

Other / Organization

Date

Recorder / Organization

Date

ATTACHMENT B
TEST EXECUTION FORM

50 pages attached

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7 / Cell 8
 System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 0

Line No.	Activity	Documented By	Completed Date
1	Notes:		
2	1. In the interest of continuation of testing, portions of this procedure may be redlined		
3	and initialed in the field during testing with concurrence from the Test Director.		
4			
5	2. Referenced status lights, switches, level indicators, meter readouts, and indicator		
6	lights are located in the Crest Pad Building except as indicated by [location]		
7	Prerequisites:		
8	Review applicable IWCP work documents (work package or technical procedures)	<i>AD</i>	2/11/09
9	The system to be tested has been inspected for workmanship and compliance with design	<i>AD</i>	2/11/09
10	Continuity tests have been performed on the electrical wiring of the systems	<i>AD</i>	2/11/09
11	Continuity tests have been performed on the instrumentation wiring of the systems	<i>AD</i>	2/11/09
12	Motor overload devices are sized (or set) correctly based on motor nameplate data	<i>AD</i>	2/10/09
13	Power is available	<i>AD</i>	2/11/09
14	Safety requirements have been implemented in accordance with the IWCP work document	<i>AD</i>	2/11/09
15	A dry run of this test has been completed to demonstrate the system operates as specified	<i>AD</i>	2/9/09
16	Configure valves to route pump discharge through the bypass pipeline	<i>AD</i>	2/11/09
17			
18	SUBCONTRACTOR furnished Testing Equipment:		
19	Flow Meter/Totalizer for measuring water added by SUBCONTRACTOR to the Sumps		
20	Meter Manufacturer/Model: <u>BLUE-WHITE F-2000</u>		
21	Calibration Expiration Date: <u>1/15/10</u>		
22	ID No. <u>TB-200MI-GPM4</u>		
23			
24	Volt/Current Meter: <u>2/11/09</u>		
25	Meter Manufacturer/Model: <u>84156306 FLUKE 336</u>		
26	Calibration Expiration Date: <u>4/4/09</u>		
27	ID No. <u>84156306</u>		
28			
29	Verify that the sump transducers levels are set to the following levels:		
30			
31	Level D4 <u>2.0'</u> (Pump 1 ON)	<i>AD</i>	2/5/09
32	Level D2 <u>1.3'</u> (Pump 2 ON)	<i>AD</i>	2/5/09
33	Level D3 <u>1.2'</u> (Pump 1 OFF)	<i>AD</i>	2/5/09
34	Level D1 <u>0.8'</u> (Pump 2 OFF)	<i>AD</i>	2/5/09
35			
36	PRIMARY SUMP		
37			
38	Level DS-2 <u>1.3'</u> (Pump 3 ON)	<i>AD</i>	2/5/09
39	Level DS-1 <u>0.8'</u> (Pump 3 OFF)	<i>AD</i>	2/5/09
40			
41	SECONDARY SUMP		
42			
43	Primary Sump level is pumped to less 0.8' level	Sump Level: <u>0.74</u>	<i>AD</i> 2/11/09
44	Secondary Sump level is pumped to less 0.8' level	Sump Level: <u>0.63</u>	<i>AD</i> 2/11/09

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 0

Line No.	Activity	Documented By	Completed Date
45			
46	Configure the Control System for the test:		
47	On the "TRENCH PUMP CONTROL PANEL":		
48	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	JW	2/11/09
49	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	JW	2/11/09
50	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	JW	2/11/09
51	Switch the roof "ROOF ALARM HAND-OFF-AUTO" switch to the "AUTO" position	JW	2/11/09
52	Switch the "CONTROL POWER ON/OFF" switch to the "ON" position	JW	2/11/09
53			
54	Verify the "PUMP 1 FAILURE" indicator light is off	JW	2/11/09
55	Verify the "PUMP 1 LOW/OFF" indicator light is on (sump level is < 1.2')	JW	2/11/09
56	Verify the "PUMP 1 HIGH/START" indicator light is off	JW	2/11/09
57	Verify the "PUMP 1 RUN" indicator light is off	JW	2/11/09
58			
59	Verify the "PUMP 2 FAILURE" indicator light is off	JW	2/11/09
60	Verify the "PUMP 2 LOW/OFF" indicator light is on (sump level is < 0.8')	JW	2/11/09
61	Verify the "PUMP 2 HIGH/START" indicator light is off	JW	2/11/09
62	Verify the "PUMP 2 RUN" indicator light is off	JW	2/11/09
63			
64	Verify the "PUMP 3 FAILURE" indicator light is off	JW	2/11/09
65	Verify the "PUMP 3 LOW/OFF" indicator light is on (if sump level is < 0.8')	JW	2/11/09
66	Verify the "PUMP 3 HIGH/START" indicator light is off	JW	2/11/09
67	Verify the "PUMP 3 RUN" indicator light is off	JW	2/11/09
68			
69	Verify the "TANK HIGH" indicator light is off	JW	2/11/09
70	Verify the "ALARM" indicator light is off	JW	2/11/09
71			
72	At the Crest Pad Building Motor Control Center (MCC):		
73	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	JW	2/11/09
74	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	JW	2/11/09
75	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	JW	2/11/09
76			
77	In the Crest Pad Building Mechanical Room:		
78	Switch the PUMP 1 disconnect switch to the "ON" position	JW	2/11/09
79	Switch the PUMP 2 disconnect switch to the "ON" position	JW	2/11/09
80	Switch the PUMP 3 disconnect switch to the "ON" position	JW	2/11/09
81			
82	On the Leachate System Control Computer in [MO-481]:		
83	Verify there is not a PUMP 1 fail alarm	JW	2/11/09
84	Verify PUMP 1 is not running (motor is red)	JW	2/11/09
85			
86	Verify there is not a PUMP 2 fail alarm	JW	2/11/09
87	Verify PUMP 2 is not running (motor is red)	JW	2/11/09
88			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7 Cell 8
 System Tested: Leachate Pumps, Transducers Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 0

Line No.	Activity	Documented By	Completed Date
89	Verify there is not a PUMP 3 fail alarm	<i>[Signature]</i>	2/11/09
90	Verify PUMP 3 is not running (motor is red)	<i>[Signature]</i>	2/11/09
91			
92	Verify there not any "HIGH HIGH TANK" alarms	<i>[Signature]</i>	2/11/09
93	Verify there is not a Cell 7 Manhole FLOOD ALARM	<i>[Signature]</i>	2/11/09
94	Verify there is not a Cell 8 Manhole FLOOD ALARM	<i>[Signature]</i>	2/11/09
95			
96	DEMONSTRATE SYSTEM OPERATION AT EACH "PRIMARY SUMP" LEVEL:		
97	Fill Primary Sump to Water Level D1:		
98	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
99	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>0.74</u>	<i>[Signature]</i>	2/11/09
100			
101	<u>On SUBCONTRACTOR provided test Equipment:</u>		
102	Initial flow totalizer reading (gallons) <u>0</u>	<i>[Signature]</i>	2/11/09
103			
104	<u>On the Leachate System Control Computer in [MO-481]:</u>		
105	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>0.74</u>	<i>[Signature]</i>	2/11/09
106			
107	Add water to the primary sump until the "PRIMARY SUMP LEVEL" is above the D1 (0.8') level and below the D3 (1.2') level.	<i>[Signature]</i>	2/11/09
108			
109			
110	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
111	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>0.85</u>	<i>[Signature]</i>	2/11/09
112			
113	<u>On SUBCONTRACTOR provided test Equipment:</u>		
114	Final flow totalizer reading (gallons) <u>557</u> Total added (gallons): <u>557</u>	<i>[Signature]</i>	2/11/09
115			
116	<u>On the Leachate System Control Computer in [MO-481]:</u>		
117	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>0.85</u>	<i>[Signature]</i>	2/11/09
118			
119	Verify PUMP 1 Operation:		
120	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
121	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	<i>[Signature]</i>	2/11/09
122	Verify that "PUMP 1" does not start	<i>[Signature]</i>	2/11/09
123	Verify the "PUMP 1 FAILURE" indicator light is off	<i>[Signature]</i>	2/11/09
124	Verify the "PUMP 1 LOW/OFF" indicator light is on	<i>[Signature]</i>	2/11/09
125	Verify the "PUMP 1 HIGH/START" indicator light is off	<i>[Signature]</i>	2/11/09
126	Verify the "PUMP 1 RUN" indicator light is off	<i>[Signature]</i>	2/11/09
127			
128	<u>On the Leachate System Control Computer in [MO-481]:</u>		
129	Verify there is not a PUMP 1 fail alarm	<i>[Signature]</i>	2/11/09
130	Verify PUMP 1 is not running (motor is red)	<i>[Signature]</i>	2/11/09
131			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7 Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 0
Flood Switches, and Controls

Line No.	Activity	Documented By	Completed Date
132	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
133	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/11/09
134			
135	Verify PUMP 2 Operation:		
136	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
137	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	AEV	2/11/09
138	Verify that "PUMP 2" does not start	AEV	2/11/09
139	Verify the "PUMP 2 FAILURE" indicator light is off	AEV	2/11/09
140	Verify the "PUMP 2 LOW/OFF" indicator light is off	AEV	2/11/09
141	Verify the "PUMP 2 HIGH/START" indicator light is off	AEV	2/11/09
142	Verify the "PUMP 2 RUN" indicator light is off	AEV	2/11/09
143			
144	<u>On the Leachate System Control Computer in [MO-481]:</u>		
145	Verify there is not a PUMP 2 fail alarm	AEV	2/11/09
146	Verify PUMP 2 is not running (motor is red)	AEV	2/11/09
147			
148	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
149	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/11/09
150			
151	Fill Primary Sump to Water Level D3:		
152	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
153	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>0.85</u>	AEV	2/11/09
154			
155	<u>On SUBCONTRACTOR provided test Equipment:</u>		
156	Initial flow totalizer reading (gallons) <u>557</u>	AEV	2/11/09
157			
158	<u>On the Leachate System Control Computer in [MO-481]:</u>		
159	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>0.85</u>	AEV	2/11/09
160			
161	Add water to the primary sump until the "PRIMARY SUMP LEVEL"		
162	is above the D3 (1.2') level and below the D2 (1.3') level.	AEV	2/11/09
163			
164	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
165	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>1.20</u>	AEV	2/11/09
166			
167	<u>On SUBCONTRACTOR provided test Equipment:</u>		
168	Final flow totalizer reading (gallons) <u>3277</u> Total added (gallons): <u>2720</u>	AEV	2/11/09
169			
170	<u>On the Leachate System Control Computer in [MO-481]:</u>		
171	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>1.21</u>	AEV	2/11/09
172			

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form	Location	Cell 7/ Cell 8
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls	Purpose:	Demonstrate that the Leachate System operates as specified
			Rev.	0
Line No.	Activity	Documented By	Completed Date	
173	Verify PUMP 1 Operation:			
174	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
175	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	AEV	2/11/09	
176	Verify that "PUMP 1" does not start	AEV	2/11/09	
177	Verify the "PUMP 1 FAILURE" indicator light is off	AEV	2/11/09	
178	Verify the "PUMP 1 LOW/OFF" indicator light is off	AEV	2/11/09	
179	Verify the "PUMP 1 HIGH/START" indicator light is off	AEV	2/11/09	
180	Verify the "PUMP 1 RUN" indicator light is off	AEV	2/11/09	
181				
182	<u>On the Leachate System Control Computer in [MO-481]:</u>			
183	Verify there is not a PUMP 1 fail alarm	AEV	2/11/09	
184	Verify PUMP 1 is not running (motor is red)	AEV	2/11/09	
185				
186	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
187	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/11/09	
188				
189	Verify PUMP 2 Operation:			
190	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
191	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	AEV	2/11/09	
192	Verify that "PUMP 2" does not start	AEV	2/11/09	
193	Verify the "PUMP 2 FAILURE" indicator light is off	AEV	2/11/09	
194	Verify the "PUMP 2 LOW/OFF" indicator light is off	AEV	2/11/09	
195	Verify the "PUMP 2 HIGH/START" indicator light is off	AEV	2/11/09	
196	Verify the "PUMP 2 RUN" indicator light is off	AEV	2/11/09	
197				
198	<u>On the Leachate System Control Computer in [MO-481]:</u>			
199	Verify there is not a PUMP 2 fail alarm	AEV	2/11/09	
200	Verify PUMP 2 is not running (motor is red)	AEV	2/11/09	
201				
202	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
203	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/11/09	
204				
205	Fill Primary Sump to Water Level D2:			
206	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
207	Initial "PRIMARY SUMP LEVEL" reading (Feet)	1.20	AEV	2/11/09
208				
209	<u>On SUBCONTRACTOR provided test Equipment:</u>			
210	Initial flow totalizer reading (gallons)	3277 AEV 2/11/09	AEV	2/11/09
211				
212	<u>On the Leachate System Control Computer in [MO-481]:</u>			
213	Initial "PRIMARY SUMP LEVEL" reading (Feet)	1.21	AEV	2/11/09
214				
215	Add water to the primary sump until the "PRIMARY SUMP LEVEL"			
216	is above the D2 (1.3") level and below the D4 (2.0') level.		AEV	2/11/09

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7/ Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
				Rev. 0	
Line No.	Activity	Documented By	Completed Date		
217					
218	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
219	Final "PRIMARY SUMP LEVEL" reading (Feet) 1.30	AEL	2/11/09		
220					
221	<u>On SUBCONTRACTOR provided test Equipment:</u>				
222	Final flow totalizer reading (gallons) 3980 Total added (gallons): 703	AEL	2/11/09		
223					
224	<u>On the Leachate System Control Computer in [MO-481]:</u>				
225	Final "PRIMARY SUMP LEVEL" reading (Feet) 1.30	AEL	2/11/09		
226					
227	Verify PUMP 1 Operation:				
228	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
229	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	AEL	2/11/09		
230	Verify that "PUMP 1" does not start	AEL	2/11/09		
231	Verify the "PUMP 1 FAILURE" indicator light is off	AEL	2/11/09		
232	Verify the "PUMP 1 LOW/OFF" indicator light is off	AEL	2/11/09		
233	Verify the "PUMP 1 HIGH/START" indicator light is off	AEL	2/11/09		
234	Verify the "PUMP 1 RUN" indicator light is off	AEL	2/11/09		
235					
236	<u>On the Leachate System Control Computer in [MO-481]:</u>				
237	Verify there is not a PUMP 1 fail alarm	AEL	2/11/09		
238	Verify PUMP 1 is not running (motor is red)	AEL	2/11/09		
239					
240	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
241	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	AEL	2/11/09		
242					
243	Verify PUMP 2 Operation:				
244	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
245	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	AEL	2/11/09		
246	Verify that "PUMP 2" starts	AEL	2/11/09		
247	Verify the "PUMP 2 FAILURE" indicator light is off	AEL	2/11/09		
248	Verify the "PUMP 2 LOW/OFF" indicator light is off	AEL	2/11/09		
249	Verify the "PUMP 2 HIGH/START" indicator light is on	AEL	2/11/09		
250	Verify the "PUMP 2 RUN" indicator light is on	AEL	2/11/09		
251					
252	<u>On the Leachate System Control Computer in [MO-481]:</u>				
253	Verify PUMP 2 is running (motor is green)	AEL	2/11/09		
254					
255	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
256	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	AEL	2/11/09		
257					

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7/Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
				Rev. 0	
Line No.	Activity	Documented By	Completed Date		
258	Fill Primary Sump to Water Level D4:				
259	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
260	Initial "PRIMARY SUMP LEVEL" reading (Feet)	1.30	ASV	2/11/09	
261					
262	<u>On SUBCONTRACTOR provided test Equipment:</u>				
263	Initial flow meter reading (gallons)	3980	ASV	2/11/09	
264					
265	<u>On the Leachate System Control Computer in [MO-481]:</u>				
266	Initial "PRIMARY SUMP LEVEL" reading (Feet)	1.30	ASV	2/11/09	
267					
268	Add water to the primary sump until the "PRIMARY SUMP LEVEL"				
269	is above the D4 (2.0') level.		ASV	2/11/09	
270					
271	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
272	Final "PRIMARY SUMP LEVEL" reading (Feet)	2.01	ASV	2/11/09	
273					
274	<u>On SUBCONTRACTOR provided test Equipment:</u>				
275	Final flow totalizer reading (gallons)	9842	Total added (gallons): 5862	ASV	2/11/09
276					
277	<u>On the Leachate System Control Computer in [MO-481]:</u>				
278	Final "PRIMARY SUMP LEVEL" reading (Feet)	2.01	ASV	2/11/09	
279					
280	Verify PUMP 1 Operation:				
281	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
282	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position		ASV	2/11/09	
283	Verify that "PUMP 1" starts		ASV	2/11/09	
284	Verify the "PUMP 1 FAILURE" indicator light is off		ASV	2/11/09	
285	Verify the "PUMP 1 LOW/OFF" indicator light is off		ASV	2/11/09	
286	Verify the "PUMP 1 HIGH/START" indicator light is on		ASV	2/11/09	
287	Verify the "PUMP 1 RUN" indicator light is on		ASV	2/11/09	
288					
289	<u>On the Leachate System Control Computer in [MO-481]:</u>				
290	Verify PUMP 1 is running (motor is green)		ASV	2/11/09	
291					
292	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
293	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position		ASV	2/11/09	
294					

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location <u>Cell 7/ Cell 8</u>	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
				Rev. 0	
Line No.	Activity	Documented By	Completed Date		
295	Verify PUMP 2 Operation:				
296	On the "TRENCH PUMP CONTROL PANEL":				
297	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	<i>ASV</i>	2/11/09		
298	Verify that "PUMP 2" starts	<i>ASV</i>	2/11/09		
299	Verify the "PUMP 2 FAILURE" indicator light is off	<i>ASV</i>	2/11/09		
300	Verify the "PUMP 2 LOW/OFF" indicator light is off	<i>ASV</i>	2/11/09		
301	Verify the "PUMP 2 HIGH/START" indicator light is on	<i>ASV</i>	2/11/09		
302	Verify the "PUMP 2 RUN" indicator light is on	<i>ASV</i>	2/11/09		
303					
304	On the Leachate System Control Computer in [MO-481]:				
305	Verify PUMP 2 is running (motor is green)	<i>ASV</i>	2/11/09		
306					
307	On the "TRENCH PUMP CONTROL PANEL":				
308	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	<i>ASV</i>	2/11/09		
309					
310	DEMONSTRATE SYSTEM OPERATION AT EACH "SECONDARY SUMP" LEVEL:				
311	Configure Pump Discharge:				
312	Configure valves on pump discharge pipelines to route pump discharge				
313	through the bypass pipeline.	<i>ASV</i>	2/11/09		
314					
315	Fill Secondary Sump to Water Level DS-1:				
316	On the "TRENCH PUMP CONTROL PANEL":				
317	Initial "SECONDARY SUMP LEVEL" reading (Feet) 0.63	<i>ASV</i>	2/11/09		
318					
319	On SUBCONTRACTOR provided test Equipment:				
320	Initial flow meter reading (gallons) 12134 <i>ASV 2/11/09</i>	<i>ASV</i>	2/11/09		
321					
322	On the Leachate System Control Computer in [MO-481]:				
323	Initial "SECONDARY SUMP LEVEL" reading (Feet) 0.63	<i>ASV</i>	2/11/09		
324					
325	Add water to the secondary sump until the "SECONDARY SUMP LEVEL"				
326	is above the DS-1 (0.8') level and below the DS-2 (1.3') level.	<i>ASV</i>	2/11/09		
327					
328	On the "TRENCH PUMP CONTROL PANEL":				
329	Final "SECONDARY SUMP LEVEL" reading (Feet) 0.80	<i>ASV</i>	2/11/09		
330					
331	On SUBCONTRACTOR provided test Equipment:				
332	Final flow meter reading (gallons) 12495 Total added (gallons): 2653 <i>ASV 2/11/09</i>	<i>ASV</i>	2/11/09		
333					
334	On the Leachate System Control Computer in [MO-481]:				
335	Final "SECONDARY SUMP LEVEL" reading (Feet) 0.80	<i>ASV</i>	2/11/09		
336					

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7/Cell 8		
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified		
Line No.		Activity		Rev. 0		
				Documented By		
				Completed Date		
337	Verify PUMP 3 Operation:					
338	<u>On the "TRENCH PUMP CONTROL PANEL":</u>					
339	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position			JEL	2/11/09	
340	Verify that "PUMP 3" does not start			JEL	2/11/09	
341	Verify the "PUMP 3 FAILURE" indicator light is off			JEL	2/11/09	
342	Verify the "PUMP 3 LOW/OFF" indicator light is off			JEL	2/11/09	
343	Verify the "PUMP 3 HIGH/START" indicator light is off			JEL	2/11/09	
344	Verify the "PUMP 3 RUN" indicator light is off			JEL	2/11/09	
345						
346	<u>On the Leachate System Control Computer in [MO-481]:</u>					
347	Verify there is not a PUMP 3 fail alarm			JEL	2/11/09	
348	Verify PUMP 3 is not running (motor is red)			JEL	2/11/09	
349						
350	<u>On the "TRENCH PUMP CONTROL PANEL":</u>					
351	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position			JEL	2/11/09	
352						
353	Fill Secondary Sump to Water Level DS-2:					
354	<u>On the "TRENCH PUMP CONTROL PANEL":</u>					
355	Initial "SECONDARY SUMP LEVEL" reading (Feet)		0.80	JEL	2/11/09	
356						
357	<u>On SUBCONTRACTOR provided test Equipment:</u>					
358	Initial flow meter reading (gallons)		12495	JEL	2/11/09	
359						
360	<u>On the Leachate System Control Computer in [MO-481]:</u>					
361	Initial "SECONDARY SUMP LEVEL" reading (Feet)		0.80	JEL	2/11/09	
362						
363	Add water to the secondary sump until the "SECONDARY SUMP LEVEL"					
364	is above the DS-2 (1.3') level.			JEL	2/11/09	
365						
366	<u>On the "TRENCH PUMP CONTROL PANEL":</u>					
367	Final "SECONDARY SUMP LEVEL" reading (Feet)		1.39	JEL	2/11/09	
368						
369	<u>On SUBCONTRACTOR provided test Equipment:</u>					
370	Final flow meter reading (gallons)		13654	Total added (gallons):	1159	
371						
372	<u>On the Leachate System Control Computer in [MO-481]:</u>					
373	Final "SECONDARY SUMP LEVEL" reading (Feet)		1.39	JEL	2/11/09	
374						

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7/Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
Line No.		Activity		Documented By	Completed Date
375	Verify PUMP 3 Operation:				
376	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
377	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position		ASV	2/11/09	
378	Verify that "PUMP 3" starts		ASV	2/11/09	
379	Verify the "PUMP 3 FAILURE" indicator light is off		ASV	2/11/09	
380	Verify the "PUMP 3 LOW/OFF" indicator light is off		ASV	2/11/09	
381	Verify the "PUMP 3 HIGH/START" indicator light is on		ASV	2/11/09	
382	Verify the "PUMP 3 RUN" indicator light is on		ASV	2/11/09	
383					
384	<u>On the Leachate System Control Computer in [MO-481]:</u>				
385	Verify there is not a PUMP 3 fail alarm		ASV	2/11/09	
386	Verify PUMP 3 is running (motor is green)		ASV	2/11/09	
387					
388	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
389	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position		ASV	2/11/09	
390					
391	DEMONSTRATE MANHOLE FLOOD SHUTDOWN:				
392	Configure the Control System for the test:				
393	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"				
394	is just above the D-4 (2.0') level.		N/A	N/A	
395					
396	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
397	Final "PRIMARY SUMP LEVEL" reading (Feet) 2.21		ASV	2/11/09	
398					
399	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"				
400	is just above the DS-2 (2.0') level.		ASV	2/11/09	
401	1.3' ASV 2/11/09		ASV	2/11/09	
402	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
403	Final "SECONDARY SUMP LEVEL" reading (Feet) 1.39		ASV	2/11/09	
404					
405	<u>In Manhole MH-30 (Cell 7) MH-31 (Cell 8) (circle MH being tested):</u>				
406	Switch the MH Flood detector disconnect switch to the "ON" position		ASV	2/11/09	
407	Note: No disconnect switches in MH-31		ASV	2/11/09	
408	<u>On the Roof of the Crest Pad Building:</u>				
409	Verify the roof alarm beacon outside of the crest pad building is off		ASV	2/11/09	
410					
411	<u>On the Leachate System Control Computer in [MO-481]:</u>				
412	Verify there is not a (Cell 7) Cell 8 (circle cell tested) Manhole FLOOD ALARM		ASV	2/11/09	
413					

Project: <u>ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form</u>		Location <u>Cell 7 / Cell 8</u>	
System Tested: <u>Leachate Pumps, Transducers Flood Switches, and Controls</u>		Purpose: <u>Demonstrate that the Leachate System operates as specified</u>	
		Rev.	0
Line No.	Activity	Documented By	Completed Date
414	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
415	Verify at least 10 minutes have elapsed since Pump 1 was shut down	JEV	2/10/09
416	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND" position	JEV	2/10/09
417	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND" position	JEV	2/10/09
418	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND" position	JEV	2/10/09
419			
420	<u>Simulate a Flood in Manhole <u>MH-30</u> (Cell 7) / MH-31 (Cell 8) (circle MH being tested):</u>		
421	While PUMP 1, PUMP 2, and PUMP 3 are running, Slowly place the flood alarm switch		
422	into a container of water	JEV	2/10/09
423			
424	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
425	Verify that "PUMP 1" stops	JEV	2/10/09
426	Verify the "PUMP 1 LOW/OFF" indicator light is off	JEV	2/10/09
427	Verify the "PUMP 1 HIGH/START" indicator light is on	JEV	2/10/09
428	Verify the "PUMP 1 RUN" indicator light is off	JEV	2/10/09
429			
430	Verify that "PUMP 2" stops	JEV	2/10/09
431	Verify the "PUMP 2 LOW/OFF" indicator light is off	JEV	2/10/09
432	Verify the "PUMP 2 HIGH/START" indicator light is on	JEV	2/10/09
433	Verify the "PUMP 2 RUN" indicator light is off	JEV	2/10/09
434			
435	Verify that "PUMP 3" stops	JEV	2/10/09
436	Verify the "PUMP 3 LOW/OFF" indicator light is off	JEV	2/10/09
437	Verify the "PUMP 3 HIGH/START" indicator light is on	JEV	2/10/09
438	Verify the "PUMP 3 RUN" indicator light is off	JEV	2/10/09
439			
440	Verify the "ALARM" indicator is on	JEV	2/10/09
441			
442	<u>On the Leachate System Control Computer in [MO-481]:</u>		
443	Verify there is a <u>Cell 7</u> / Cell 8 (circle cell tested) Manhole FLOOD ALARM	JEV	2/10/09
444	Verify PUMP 1 is not running (motor is red)	JEV	2/10/09
445	Verify PUMP 2 is not running (motor is red)	JEV	2/10/09
446	Verify PUMP 3 is not running (motor is red)	JEV	2/10/09
447	Verify the Auto-dialer begins calling	JEV	2/10/09
448			
449	<u>On the Roof of the Crest Pad Building:</u>		
450	Verify the roof alarm beacon outside of the crest pad building is on	JEV	2/10/09
451			
452	<u>Remove the water from the MH flood switch</u> → <u>MOVED TO LINE 458</u>	JEV	2/10/09
453			

JEV 2/11/09
 WAB 2/23/09
 RH 2/23/09
 RA 2/24/09

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: <u>Cell 7 / Cell 8</u>	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
Line No.		Activity		Documented By	Completed Date
454	On the "TRENCH PUMP CONTROL PANEL":				
455	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position		ASV	2/11/09	
456	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position		ASV	2/11/09	
457	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position		ASV	2/11/09	
458	REMOVE THE WATER FROM THE M.H FLOOD SWITCH		ASV 2/23/09		
459	On the Leachate System Control Computer in [MO-481]:				
460	Acknowledge the Manhole FLOOD alarm		WAS 2/23/09 RH 2/23/09	ASV	2/11/09
461					
462	DEMONSTRATE HIGH TANK SHUTDOWN:				
463	Verify HIGH Leachate Storage Tank Levels Shutdown PUMP 1, PUMP 2, & PUMP 3:				
464	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"				
465	is just above the D-4 (2.0') level.		ASV	2/11/09	
466					
467	On the "TRENCH PUMP CONTROL PANEL":				
468	Final "PRIMARY SUMP LEVEL" reading (Feet)		2.20	ASV	2/11/09
469					
470	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"				
471	is just above the DS-2 (2.0') level.			N/A	N/A
472	1.3 WAS 2/24/09 RH 2/23/09		ASV 2/23/09 RH 2/24/09		
473	On the "TRENCH PUMP CONTROL PANEL":				
474	Final "SECONDARY SUMP LEVEL" reading (Feet)		1.39	ASV	2/11/09
475					
476	On the Roof of the Crest Pad Building:				
477	Verify the roof alarm beacon outside of the crest pad building is off		ASV	2/11/09	
478					
479	On the "TRENCH PUMP CONTROL PANEL":				
480	Verify at least 10 minutes have elapsed since Pump 1 was shut down		ASV	2/11/09	
481	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND" position		ASV	2/11/09	
482	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND" position		ASV	2/11/09	
483	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND" position		ASV	2/11/09	
484					
485	Introduce a High Tank Level signal				
486	While PUMP 1, PUMP 2, and PUMP 3 are running, simulate high water levels in the				
487	Leachate Storage Tanks		ASV	2/11/09	
488					
489	On the "TRENCH PUMP CONTROL PANEL":				
490	Verify that "PUMP 1" stops		ASV	2/11/09	
491	Verify the "PUMP 1 LOW/OFF" indicator light is off		ASV	2/11/09	
492	Verify the "PUMP 1 HIGH/START" indicator light is on		ASV	2/11/09	
493	Verify the "PUMP 1 RUN" indicator light is off		ASV	2/11/09	
494					

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7, Cell 8

System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 0

Line No.	Activity	Documented By	Completed Date
495	Verify that "PUMP 2" stops	ASV	2/11/09
496	Verify the "PUMP 2 LOW/OFF" indicator light is off	ASV	2/11/09
497	Verify the "PUMP 2 HIGH/START" indicator light is on	ASV	2/11/09
498	Verify the "PUMP 2 RUN" indicator light is off	ASV	2/11/09
499			
500	Verify that "PUMP 3" stops	ASV	2/11/09
501	Verify the "PUMP 3 LOW/OFF" indicator light is off	ASV	2/11/09
502	Verify the "PUMP 3 HIGH/START" indicator light is on	ASV	2/11/09
503	Verify the "PUMP 3 RUN" indicator light is off	ASV	2/11/09
504			
505	Verify the "TANK HIGH" indicator is on	ASV	2/11/09
506	Verify the "ALARM" indicator is on	ASV	2/11/09
507	OFF ASV 2/11/09 ^{MS 2/24/09} _{WAB 2/23/09}		
508	On the Leachate System Control Computer in [MO-481]: ^{RH 2/23/09} _{WAB 2/23/09}		
509	Verify there is a HIGH HIGH TANK alarm - Deleted ^{RH 2/23/09} _{WAB 2/23/09}	ASV	2/11/09
510	Verify PUMP 1 is not running (motor is red) ^{See exception cell 7-01}	ASV	2/11/09
511	Verify PUMP 2 is not running (motor is red) ^{RH 2/23/09}	ASV	2/11/09
512	Verify PUMP 3 is not running (motor is red) ^{WAB 2/23/09}	ASV	2/11/09
513	Verify the Auto-dialer begins calling - Deleted ^{ASV 2/11/09}	ASV	2/11/09
514			
515	On the Roof of the Crest Pad Building: ^{RH 2/23/09} _{WAB 2/23/09}		
516	Verify the roof alarm beacon outside of the crest pad building is on OFF ^{ASV 2/11/09}	ASV	2/11/09
517	NOTE: Roof Alarm beacon does not light on High High Tank alarm.		
518	Remove the High Tank Level signal ^{MOVED TO Follow - Line 526}	ASV	2/11/09
519			
520	On the "TRENCH PUMP CONTROL PANEL": ^{ASV 2/11/09} _{WAB 2/23/09} ^{MS 2/24/09}		
521	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position ^{RH 2/23/09}	ASV	2/11/09
522	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09
523	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09
524	Record "PRIMARY SUMP LEVEL" reading (Feet) <u>2.19</u>	ASV	2/11/09
525	Reset the HIGH TANK alarm	ASV	2/11/09
526	Record "Secondary Sump Level" reading (Feet) <u>1.38</u>	ASV	2/11/09
527	On the Leachate System Control Computer in [MO-481]: ^{ASV 2/11/09} _{WAB 2/23/09}		
528	Acknowledge the HIGH HIGH TANK alarm - Deleted ^{SEE EXCEPTION} _{RH 2/23/09}	N/A	N/A
529			
530	DEMONSTRATE PUMP "FAIL" OPERATION		
531	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL" is just above the D-4 (2.0') level.	N/A	N/A
532			
533			
534	On the "TRENCH PUMP CONTROL PANEL":		
535	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>2.19</u>	ASV	2/11/09
536	INITIAL ^{ASV 2/11/09} _{WAB 2/23/09} ^{RH 2/23/09} _{MS 2/24/09}		

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7 / Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
Rev.:		0			
Line No.	Activity	Documented By	Completed Date		
537	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"				
538	is just above the DS-2 (2.0') level.	ASV	2/11/09		
539	1.3 40V 2/11/09				
540	On the "TRENCH PUMP CONTROL PANEL":				
541	Final "SECONDARY SUMP LEVEL" reading (Feet)				
542	Initial 70V 2/11/09				
543	On the "TRENCH PUMP CONTROL PANEL":				
544	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09		
545	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09		
546	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09		
547					
548	At the Crest Pad Building Motor Control Center (MCC):				
549	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09		
550	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09		
551	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/11/09		
552					
553	On the "FLOW TRANSMITTER PANEL":				
554	Initial "PUMP 1" flow meter totalizer reading (gallons)				
555	Initial "PUMP 2" flow meter totalizer reading (gallons)				
556	Initial "PUMP 3" flow meter totalizer reading (gallons)				
557					
558	Verify PUMP 1 Alarms:				
559	On the "TRENCH PUMP CONTROL PANEL":				
560	Verify the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	ASV	2/11/09		
561	Verify the "PUMP 1 FAILURE" indicator light is on	ASV	2/11/09		
562	Verify the "PUMP 1 LOW/OFF" indicator light is off	ASV	2/11/09		
563	Verify the "PUMP 1 HIGH/START" indicator light is on	ASV	2/11/09		
564	Verify the "PUMP 1 RUN" indicator light is off	ASV	2/11/09		
565	Verify the "ALARM" indicator is on	ASV	2/11/09		
566					
567	On the Roof of the Crest Pad Building:				
568	Verify the roof light outside of the crest pad building is on	ASV	2/11/09		
569					
570	On the Leachate System Control Computer in [MO-481]:				
571	Verify there is a PUMP 1 fail alarm	ASV	2/11/09		
572	Verify PUMP 1 is not running (motor is red)	ASV	2/11/09		
573	Verify autodialer begins calling	ASV	2/11/09		
574					

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location (Cell 7) Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
Rev.		0			
Line No.	Activity	Documented By	Completed Date		
575	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
576	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASU	2/11/09		
577	Verify the "PUMP 1 FAILURE" indicator is off	ASU	2/11/09		
578	Verify the "PUMP 1 LOW/OFF" indicator is off	ASU	2/11/09		
579	Verify the "PUMP 1 HIGH/START" indicator is on	ASU	2/11/09		
580	Verify the "PUMP 1 RUN" indicator is off	ASU	2/11/09		
581	Verify the Crest Pad Building "ALARM" indicator is off	ASU	2/11/09		
582					
583	<u>On the Roof of the Crest Pad Building:</u>				
584	Verify the roof light outside of the crest pad building is off	ASU	2/11/09		
585					
586	<u>On the Leachate System Control Computer in [MO-481]:</u>				
587	Acknowledge PUMP 1 fail alarm	ASU	2/11/09		
588					
589	Verify PUMP 2 Alarms:				
590	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
591	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	ASU	2/11/09		
592	Verify the "PUMP 2 FAILURE" indicator light is on	ASU	2/11/09		
593	Verify the "PUMP 2 LOW/OFF" indicator light is off	ASU	2/11/09		
594	Verify the "PUMP 2 HIGH/START" indicator light is on	ASU	2/11/09		
595	Verify the "PUMP 2 RUN" indicator light is off	ASU	2/11/09		
596	Verify the "ALARM" indicator is on	ASU	2/11/09		
597					
598	<u>On the Roof of the Crest Pad Building:</u>				
599	Verify the roof light outside of the crest pad building is on	ASU	2/11/09		
600					
601	<u>On the Leachate System Control Computer in [MO-481]:</u>				
602	Verify there is a PUMP 2 fail alarm	ASU	2/11/09		
603	Verify PUMP 2 is not running (motor is red) yellow Ad 2/11/09	ASU	2/11/09		
604	Verify autodialer begins calling WAB 2/23/09 RH 2/23/09	ASU	2/11/09		
605					
606	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
607	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASU	2/11/09		
608	Verify the "PUMP 2 FAILURE" indicator is off	ASU	2/11/09		
609	Verify the "PUMP 2 LOW/OFF" indicator is off	ASU	2/11/09		
610	Verify the "PUMP 2 HIGH/START" indicator is on	ASU	2/11/09		
611	Verify the "PUMP 2 RUN" indicator is off	ASU	2/11/09		
612	Verify the Crest Pad Building "ALARM" indicator is off	ASU	2/11/09		
613					
614	<u>On the Roof of the Crest Pad Building:</u>				
615	Verify the roof light outside of the crest pad building is off	ASU	2/11/09		
616					

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7/ Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
		Rev.		0	
Line No.	Activity	Documented By	Completed Date		
617	<u>On the Leachate System Control Computer in [MO-481]:</u>				
618	Acknowledge PUMP 2 fail alarm	<i>ASV</i>	2/11/09		
619					
620	Verify PUMP 3 Alarms:				
621	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
622	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	<i>ASV</i>	2/11/09		
623	Verify the "PUMP 3 FAILURE" indicator light is on	<i>ASV</i>	2/11/09		
624	Verify the "PUMP 3 LOW/OFF" indicator light is off	<i>ASV</i>	2/11/09		
625	Verify the "PUMP 3 HIGH/START" indicator light is on	<i>ASV</i>	2/11/09		
626	Verify the "PUMP 3 RUN" indicator light is off	<i>ASV</i>	2/11/09		
627	Verify the "ALARM" indicator is on	<i>ASV</i>	2/11/09		
628					
629	<u>On the Roof of the Crest Pad Building:</u>				
630	Verify the roof light outside of the crest pad building is on	<i>ASV</i>	2/11/09		
631					
632	<u>On the Leachate System Control Computer in [MO-481]:</u>				
633	Verify there is a PUMP 3 fail alarm	<i>ASV</i>	2/11/09		
634	Verify PUMP 3 is not running (motor is red yellow)	<i>ASV</i> 2/11/09	2/11/09		
635	Verify autodialer begins calling	<i>ASV</i> 2/23/09 RH 2/23/09	2/11/09		
636					
637	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
638	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	<i>ASV</i>	2/11/09		
639	Verify the "PUMP 3 FAILURE" indicator is off	<i>ASV</i>	2/11/09		
640	Verify the "PUMP 3 LOW/OFF" indicator is off	<i>ASV</i>	2/11/09		
641	Verify the "PUMP 3 HIGH/START" indicator is on	<i>ASV</i>	2/11/09		
642	Verify the "PUMP 3 RUN" indicator is off	<i>ASV</i>	2/11/09		
643	Verify the Crest Pad Building "ALARM" indicator is off	<i>ASV</i>	2/11/09		
644					
645	<u>On the Roof of the Crest Pad Building:</u>				
646	Verify the roof light outside of the crest pad building is off	<i>ASV</i>	2/11/09		
647					
648	<u>On the Leachate System Control Computer in [MO-481]:</u>				
649	Acknowledge PUMP 3 fail alarm	<i>ASV</i>	2/11/09		
650					
651	DEMONSTRATE PUMP "HAND" OPERATION:				
652	Verify PUMP 1 "HAND" Operation:				
653	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"				
654	is just above the D-4 (2.0') level.			N/A	N/A
655					
656	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
657	Final "PRIMARY SUMP LEVEL" reading (Feet)		2.19	<i>ASV</i>	2/11/09
658	Initial	<i>ASV</i> 2/11/09 WAS 2/23/09 RH 2/23/09 ASV 2/24/09			

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7/Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
		Rev. 0			
Line No.	Activity	Documented By	Completed Date		
659	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"				
660	is just above the DS-2 (2.0) level.				
661					
662	On the "TRENCH PUMP CONTROL PANEL":				
663	Final "SECONDARY SUMP LEVEL" reading (Feet)		1.37	ASV	2/11/09
664					
665	At the Crest Pad Building Motor Control Center (MCC):				
666	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND" position			ASV	2/11/09
667					
668	On the "TRENCH PUMP CONTROL PANEL":				
669	Verify at least 10 minutes have elapsed since Pump 1 was shut down			ASV	2/11/09
670	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND" position			ASV	2/11/09
671	Verify that "PUMP 1" starts			ASV	2/11/09
672	Verify the "PUMP 1 FAILURE" indicator light is off			ASV	2/11/09
673	Verify the "PUMP 1 LOW/OFF" indicator light is off			ASV	2/11/09
674	Verify the "PUMP 1 HIGH/START" indicator light is on			ASV	2/11/09
675	Verify the "PUMP 1 RUN" indicator light is on			ASV	2/11/09
676	Pump 1 "FLOW RATE (GAL/MIN)" reading		158.0	ASV	2/11/09
677	Verify PUMP 1 produces minimum 140 gpm		(Yes)	No	ASV
678					
679	On the "FLOW TRANSMITTER PANEL":				
680	Pump 1 "FLOW RATE (GAL/MIN)" reading		158.3	ASV	2/11/09
681					
682	On the Leachate System Control Computer in [MO-481]:				
683	Verify there is not a PUMP 1 fail alarm			ASV	2/11/09
684	Verify PUMP 1 is running (motor is green)			ASV	2/11/09
685	Pump 1 "FLOW RATE (GAL/MIN)" reading		159.3	ASV	2/11/09
686					
687	Measure Pump No. 1 Phase Current		A: 9.0 B: 8.1 C: 10.0	ASV	2/11/09
688					
689	On the "TRENCH PUMP CONTROL PANEL":				
690	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position			ASV	2/11/09
691	Verify that "PUMP 1" stops			ASV	2/11/09
692					
693	On the Leachate System Control Computer in [MO-481]:				
694	Verify PUMP 1 is not running (motor is red)			ASV	2/11/09
695					
696	Verify PUMP 2 "HAND" Operation:				
697	At the Crest Pad Building Motor Control Center (MCC):				
698	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND" position			ASV	2/11/09
699					

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/ Cell 8
 System Tested: Leachate Pumps, Transducers Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 0

Line No.	Activity	Documented By	Completed Date
700	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
701	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND" position	AEV	2/11/09
702	Verify that "PUMP 2" starts	AEV	2/11/09
703	Verify the "PUMP 2 FAILURE" indicator light is off	AEV	2/11/09
704	Verify the "PUMP 2 LOW/OFF" indicator light is off	AEV	2/11/09
705	Verify the "PUMP 2 HIGH/START" indicator light is on	AEV	2/11/09
706	Verify the "PUMP 2 RUN" indicator light is on	AEV	2/11/09
707	PUMP 2 "FLOW RATE (GAL/MIN)" reading	AEV	28.0 2/11/09
708	Verify PUMP 2 produces minimum 15 gpm	AEV	Yes No 2/11/09
709			
710	<u>On the "FLOW TRANSMITTER PANEL":</u>		
711	PUMP 2 "FLOW RATE (GAL/MIN)" reading	AEV	28.0 2/11/09
712			
713	<u>On the Leachate System Control Computer in [MO-481]:</u>		
714	Verify there is not a PUMP 2 fail alarm	AEV	2/11/09
715	Verify PUMP 2 is running (motor is green)	AEV	2/11/09
716	PUMP 2 "FLOW RATE (GAL/MIN)" reading	AEV	28.2 2/11/09
717			
718	Measure Pump No. 2 Phase Current		A: 1.6 B: 1.6 C: 1.2 2/11/09
719			
720	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
721	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/11/09
722	Verify that "PUMP 2" stops	AEV	2/11/09
723			
724	<u>On the Leachate System Control Computer in [MO-481]:</u>		
725	Verify PUMP 2 is not running (motor is red)	AEV	2/11/09
726			
727	Verify PUMP 3 "HAND" Operation:		
728	<u>At the Crest Pad Building Motor Control Center (MCC):</u>		
729	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND" position	AEV	2/11/09
730			AUTO AEV 2/11/09 WAB 2/23/09 RH 2/23/09 Also 2/24/09
731	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
732	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND" position	AEV	2/11/09
733	Verify that "PUMP 3" starts	AEV	2/11/09
734	Verify the "PUMP 3 FAILURE" indicator light is off	AEV	2/11/09
735	Verify the "PUMP 3 LOW/OFF" indicator light is off	AEV	2/11/09
736	Verify the "PUMP 3 HIGH/START" indicator light is on	AEV	2/11/09
737	Verify the "PUMP 3 RUN" indicator light is on	AEV	2/11/09
738	PUMP 3 "FLOW RATE (GAL/MIN)" reading	AEV	29.0 2/11/09
739	Verify PUMP 3 produces minimum 15 gpm	AEV	Yes No 2/11/09
740			
741	<u>On the "FLOW TRANSMITTER PANEL":</u>		
742	PUMP 3 "FLOW RATE (GAL/MIN)" reading	AEV	29.0 2/11/09
743			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7 Cell 8	
System Tested: Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
		Rev. 0	
Line No.	Activity	Documented By	Completed Date
744	On the Leachate System Control Computer in [MO-481]:		
745	Verify there is not a PUMP 3 fail alarm	JEV	2/11/09
746	Verify PUMP 3 is running (motor is green)	JEV	2/11/09
747	PUMP 3 "FLOW RATE (GAL/MIN)" reading 292	JEV	2/11/09
748			
749	Measure Pump No. 3 Phase Current A: 1.5 B: 1.5 C: 1.9	JEV	2/11/09
750			
751	On the "TRENCH PUMP CONTROL PANEL":		
752	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	JEV	2/11/09
753	Verify that "PUMP 3" stops	JEV	2/11/09
754			
755	On the Leachate System Control Computer in [MO-481]:		
756	Verify PUMP 3 is not running (motor is red)	JEV	2/11/09
757			
758	DEMONSTRATE PUMP "AUTO" OPERATION:		
759	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL" is just above the D-4 (2.0') level.	N/A	N/A
760			
761			
762	On the "TRENCH PUMP CONTROL PANEL":		
763	Final "PRIMARY SUMP LEVEL" reading (Feet) 2.14	JEV	2/11/09
764	Initial JEV 2/11/09 was 2/23/09 RH 2/23/09 MS 2/24/09		
765	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL" is just above the DS-2 (2.0') level.	N/A	N/A
766			
767	1.3 JEV 2/11/09 was 2/23/09 MS 2/24/09		
768	On the "TRENCH PUMP CONTROL PANEL": RH 2/23/09		
769	Final "SECONDARY SUMP LEVEL" reading (Feet) 1.34	JEV	2/11/09
770	Initial JEV 2/11/09 was 2/23/09 MS 2/24/09		
771	Verify PUMP 1 "AUTO" Operation: RH 2/23/09		
772	On the "TRENCH PUMP CONTROL PANEL":		
773	Verify at least 10 minutes have elapsed since Pump 1 was shut down	JEV	2/11/09
774	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	JEV	2/11/09
775	Verify that "PUMP 1" starts	JEV	2/11/09
776	Verify the "PUMP 1 FAILURE" indicator light is off	JEV	2/11/09
777	Verify the "PUMP 1 LOW/OFF" indicator light is off	JEV	2/11/09
778	Verify the "PUMP 1 HIGH/START" indicator light is on	JEV	2/11/09
779	Verify the "PUMP 1 RUN" indicator light is on	JEV	2/11/09
780	Pump 1 "FLOW RATE (GAL/MIN)" reading 160.0	JEV	2/11/09
781			
782	On the "FLOW TRANSMITTER PANEL":		
783	Pump 1 "FLOW RATE (GAL/MIN)" reading 160.0	JEV	2/11/09
784			

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7 Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
				Rev. 0	
Line No.	Activity	Documented By	Completed Date		
785	On the Leachate System Control Computer in [MO-481]:				
786	Verify there is not a PUMP 1 fail alarm	ASV	2/11/09		
787	Verify PUMP 1 is running (motor is green)	ASV	2/11/09		
788	Pump 1 "FLOW RATE (GAL/MIN)" reading	ASV	2/11/09	157.9	
789					
790	Verify PUMP 2 "AUTO" Operation:				
791	On the "TRENCH PUMP CONTROL PANEL":				
792	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	ASV	2/11/09		
793	Verify that "PUMP 2" starts	ASV	2/11/09		
794	Verify the "PUMP 2 FAILURE" indicator light is off	ASV	2/11/09		
795	Verify the "PUMP 2 LOW/OFF" indicator light is off	ASV	2/11/09		
796	Verify the "PUMP 2 HIGH/START" indicator light is on	ASV	2/11/09		
797	Verify the "PUMP 2 RUN" indicator light is on	ASV	2/11/09		
798	PUMP 2 "FLOW RATE (GAL/MIN)" reading	ASV	2/11/09	27.5	
799					
800	On the "FLOW TRANSMITTER PANEL":				
801	PUMP 2 "FLOW RATE (GAL/MIN)" reading	ASV	2/11/09	27.5	
802					
803	On the Leachate System Control Computer in [MO-481]:				
804	Verify there is not a PUMP 2 fail alarm	ASV	2/11/09		
805	Verify PUMP 2 is running (motor is green)	ASV	2/11/09		
806	PUMP 2 "FLOW RATE (GAL/MIN)" reading	ASV	2/11/09	28.1	
807					
808	Verify PUMP 1 "AUTO" Shutdown:				
809	Continue operation of PUMP 1 until PUMP 1 shuts off (at Level D3 - 1.2')				
810	Verify that PUMP 1 shuts off	ASV	2/11/09		
811					
812	On the "TRENCH PUMP CONTROL PANEL":				
813	Verify the "PUMP 1 FAILURE" indicator light is off	ASV	2/11/09		
814	Verify the "PUMP 1 LOW/OFF" indicator light is on	ASV	2/11/09		
815	Verify the "PUMP 1 HIGH/START" indicator light is off	ASV	2/11/09		
816	Verify the "PUMP 1 RUN" indicator light is off	ASV	2/11/09		
817	"PRIMARY SUMP LEVEL" reading when PUMP 1 shuts off (Feet)	ASV	2/11/09	1.22	
818					
819	On the "FLOW TRANSMITTER PANEL":				
820	PUMP 1 flow meter totalizer reading (gal)	ASV	2/11/09	26892.5	Total pumped (gal): 7041.8
821	Reset PUMP 1 totalizer	ASV	2/11/09		
822					
823	On the Leachate System Control Computer in [MO-481]:				
824	Verify PUMP 1 is not running (motor is red)	ASV	2/11/09		
825	PUMP 1 flow meter totalizer reading (gal)	N/A	N/A		
826	Reset PUMP 1 totalizer.	ASV 2/11/09	2/11/09		
827					

SEE EXCEPTION CELL 7-02

RA 2/23/09
ASV 2/12/09

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location: Cell 7 / Cell 8	
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	
				Rev. 0	
Line No.	Activity	Documented By	Completed Date		
828	On the "TRENCH PUMP CONTROL PANEL":				
829	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	4EV	2/11/09		
830					
831	Verify PUMP 2 "AUTO" Shutdown:				
832	Continue operation of PUMP 2 until PUMP 2 shuts off (at Level D1 - 0.8')				
833	Verify that PUMP 2 shuts off	4EV	2/11/09		
834					
835	On the "TRENCH PUMP CONTROL PANEL":				
836	Verify the "PUMP 2 FAILURE" indicator light is off	4EV	2/11/09		
837	Verify the "PUMP 2 LOW/OFF" indicator light is on	4EV	2/11/09		
838	Verify the "PUMP 2 HIGH/START" indicator light is off	4EV	2/11/09		
839	Verify the "PUMP 2 RUN" indicator light is off	4EV	2/11/09		
840	"PRIMARY SUMP LEVEL" reading when PUMP 2 shuts off	4EV	2/11/09	0.80	
841					
842	On the "FLOW TRANSMITTER PANEL":				
843	PUMP 2 flow meter totalizer reading (gal)	4EV	2/11/09	5855.6	Total pumped (gal): 2525.2
844	Reset PUMP 2 totalizer	4EV	2/11/09	+ 37.5 - pumped from pump #1	
845				4EV	2/11/09
846	On the Leachate System Control Computer in [MO-481]:				
847	Verify PUMP 2 is not running (motor is red)	4EV	2/11/09		
848	PUMP 2 flow meter totalizer reading (gal)	N/A	N/A		
849	Reset PUMP 2 totalizer	N/A	N/A		
850	DELETE SOE EXCEPTION CELL 7-02			was 2/23/09 R# 2/23/09	
851	On the "TRENCH PUMP CONTROL PANEL":				
852	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	4EV	2/11/09		
853					
854	Verify PUMP 3 "AUTO" Operation:				
855	On the "TRENCH PUMP CONTROL PANEL":				
856	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	4EV	2/11/09		
857	Verify that "PUMP 3" starts	4EV	2/11/09		
858	Verify the "PUMP 3 FAILURE" indicator light is off	4EV	2/11/09		
859	Verify the "PUMP 3 LOW/OFF" indicator light is off	4EV	2/11/09		
860	Verify the "PUMP 3 HIGH/START" indicator light is on	4EV	2/11/09		
861	Verify the "PUMP 3 RUN" indicator light is on	4EV	2/11/09		
862	PUMP 3 "FLOW RATE (GAL/MIN)" reading	4EV	2/11/09	28.4	
863					
864	On the "FLOW TRANSMITTER PANEL":				
865	PUMP 3 "FLOW RATE (GAL/MIN)" reading	4EV	2/11/09	28.4	
866					
867	On the Leachate System Control Computer in [MO-481]:				
868	Verify there is not a PUMP 3 fail alarm	4EV	2/11/09		
869	Verify PUMP 3 is running (motor is green)	4EV	2/11/09		
870	PUMP 3 "FLOW RATE (GAL/MIN)" reading	4EV	2/11/09	28.0	
871					

Project: <u>ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form</u>		Location: <u>Cell 7/ Cell 8</u>	
System Tested: <u>Leachate Pumps, Transducers Flood Switches, and Controls</u>		Purpose: <u>Demonstrate that the Leachate System operates as specified</u>	
		Rev. <u>0</u>	
Line No.	Activity	Documented By	Completed Date
872	Verify PUMP 3 "AUTO" Shutdown:		
873	Continue operation of PUMP 3 until PUMP 3 shuts off at Level DS-1 (1.27) <i>0.8' WAB 2/24/09</i>		
874	Verify that PUMP 3 shuts off <i>0.8' JW 2/11/09</i>	<i>JW</i>	<i>2/11/09</i>
875		<i>WAB 2/23/09</i>	
876	<u>On the "TRENCH PUMP CONTROL PANEL":</u> <i>RH 2/23/09</i>		
877	Verify the "PUMP 3 FAILURE" indicator light is off	<i>JW</i>	<i>2/11/09</i>
878	Verify the "PUMP 3 LOW/OFF" indicator light is on	<i>JW</i>	<i>2/11/09</i>
879	Verify the "PUMP 3 HIGH/START" indicator light is off	<i>JW</i>	<i>2/11/09</i>
880	Verify the "PUMP 3 RUN" indicator light is off	<i>JW</i>	<i>2/11/09</i>
881	"SECONDARY SUMP LEVEL" reading when PUMP 3 shuts off (Feet) <i>0.82</i>	<i>JW</i>	<i>2/11/09</i>
882			
883	<u>On the "FLOW TRANSMITTER PANEL":</u>		
884	PUMP 3 flow meter totalizer reading (gal) <i>5051.6</i> Total pumped (gal): <i>1429.0</i>	<i>JW</i>	<i>2/11/09</i>
885	Reset PUMP 3 totalizer	<i>JW</i>	<i>2/11/09</i>
886			
887	<u>On the Leachate System Control Computer in [MO-481]:</u>		
888	Verify PUMP 3 is not running (motor is red)	<i>JW</i>	<i>2/11/09</i>
889	PUMP 3 flow meter totalizer reading (gal) Total pumped (gal):	<i>JW</i>	<i>2/11/09</i>
890	Reset PUMP 3 totalizer	<i>JW</i>	<i>2/11/09</i>
891	<i>2/11/09</i> SEE EXCEPTION CELL 7-02 <i>WAB 2/23/09</i> <i>RH 2/23/09</i> <i>MR 2/24/09</i>		
892	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
893	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	<i>JW</i>	<i>2/11/09</i>
894			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7 Cell 8

System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 0
Flood Switches, and Controls

Line No.	Activity	Documented By	Completed Date
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Exceptions:

Number of Exceptions (Attached): 2

Summary of Exceptions, Actions Taken, and Results:

CELL 7-01: DIO NOT SIMULATE "High High Tank" Alarm from Leachate System Control Computer in MO-481

CELL 7-02: THE LEACHATE SYSTEM CONTROL COMPUTER IN MO-481 DOES NOT HAVE A FLOW TOTALIZER

Witnesses:

<u>W.A. BORLAUG</u> WCH Construction Project Manager (Print & Signature)	<u>W.A. Borlaug</u> WCH Company	<u>2/12/09</u> Date
<u>ROBYN M. KELSO</u> WCH STR (Print & Signature)	<u>Robyn M. Kelso FOR B.J. HOWARD</u> WCH Company	<u>2/12/09</u> Date
<u>Ryan Harris</u> TEST DIRECTOR (Print & Signature)	<u>Ryan Harris</u> TEM Company	<u>2-12-09</u> Date
<u>DAVE STERLEY</u> SUBCONTRACTOR QC (Print & Signature)	<u>Dave Sterley</u> Delhav, Inc. Company	<u>2/12/09</u> Date
<u>JOSEPH VOSS</u> CQA SUBCONTRACTOR/Recorder (Print & Signature)	<u>Joseph Voss</u> ENVIROTECH Company	<u>2/12/09</u> Date
<u>ADRIAN GOVERN</u> Witness (Print & Signature)	<u>Adrian Govern</u> WCH Company	<u>2/12/09</u> Date
<u>NICK CLAPPER</u> Witness (Print & Signature)	<u>Nick Clapper</u> DHI Company	<u>2-12-09</u> Date
<u>RODNEY R. THORNE</u> Witness (Print & Signature)	<u>Rodney R. Thorne</u> WCH-RH Company	<u>2/12/09</u> Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date

ATP Reviewed By:

<u>OWEN ROBERTSON</u> DOE-RL (Print & Signature)	<u>Owen Robertson</u> DOE-RL Company	<u>2/12/09</u> Date
<u>DAVID R. EHRAN</u> EPA (Print & Signature)	<u>David R. Ebran</u> EPA Company	<u>12 Feb 09</u> Date

* THE ORIGINAL EXCEPTION NO. CELL 7-01 signed and dated 2/12/09
 WAS MISPLACED AND THIS REPLACEMENT FORM WAS RESIGNED AND ADDED
 TO ACCEPTANCE TEST EXECUTION FORM. WAB
 2/23/09

EXCEPTION FORM

EXCEPTION NUMBER. CELL 7-01 SHEET 1 OF 1

DATE 2/11/09

EXCEPTIONS BY: W.A. BORLAUG
 NAME
WCH
 ORGANIZATION

DESCRIPTION: LINE NOS. 509, 513, and 528 were not performed.
SIMULATING THE "HIGH HIGH TANK" ALARM AT THE LEACHATE
SYSTEM CONTROL COMPUTER IN [MO-481] WILL SHUT DOWN THE
PUMPS IN ACTIVE CELLS 1 THROUGH 6.

ACTION TAKEN: SIMULATED "HIGH HIGH TANK" ALARM ONLY TO
CELL 7 OR CELL 8, TO DEMONSTRATE PUMPS WILL SHUT OFF
WHEN THERE IS A "HIGH HIGH TANK" ALARM.

APPROVED:

W.A. Borlaug for T. KISENWEHNER 2/11/09
 WCH Construction Manager Date

Ryan Harris 2/23/09
 Total Energy Management Date

Robyn M. Kelso 2/24/09
 Test Director Date

Rodney Thamm 2/24/09
 Witness Name / Organization Date

Delhur Industries 2/23/09
 Construction Subcontractor / Organization Date

WCH 2/24/09
 Other / Organization Date

for EV 2/23/09
 Recorder / Organization Date

EXCEPTION FORM

EXCEPTION NUMBER. CELL-02

SHEET 1 OF 1

DATE 2/11/09

EXCEPTIONS BY: W.A. Borlaug
NAME
WCH
ORGANIZATION

DESCRIPTION: LINE NOS. 825, 826, 848, 849, 889, AND 890
CAN NOT BE COMPLETED BECAUSE THE LEAKRATE SYSTEM
CONTROL COMPUTER IN MO-481 DOES NOT DISPLAY FLOW TOTALS.
FLOW TOTALS ARE DISPLAYED ONLY IN THE CREST PAD BUILDINGS.
ACTION TAKEN: NONE REQUIRED.

APPROVED:

W.A. Borlaug for T. KISENWEHER
WCH Construction Manager

2/11/09
Date

Ryan Harris
Test Director

2-12-09
Date

R.M. Kelso For B. JACK HOWARD / WCH
Witness Name / Organization

2/12/09
Date

[Signature] WCH
Witness Name / Organization

2/12/09
Date

[Signature] Deltek, Inc.
Construction Subcontractor / Organization

2/12/09
Date

Other / Organization
[Signature] ENVIROTECH - CQA

Date
2/12/09

Recorder / Organization

Date

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7 / Cell 8
 System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
 Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
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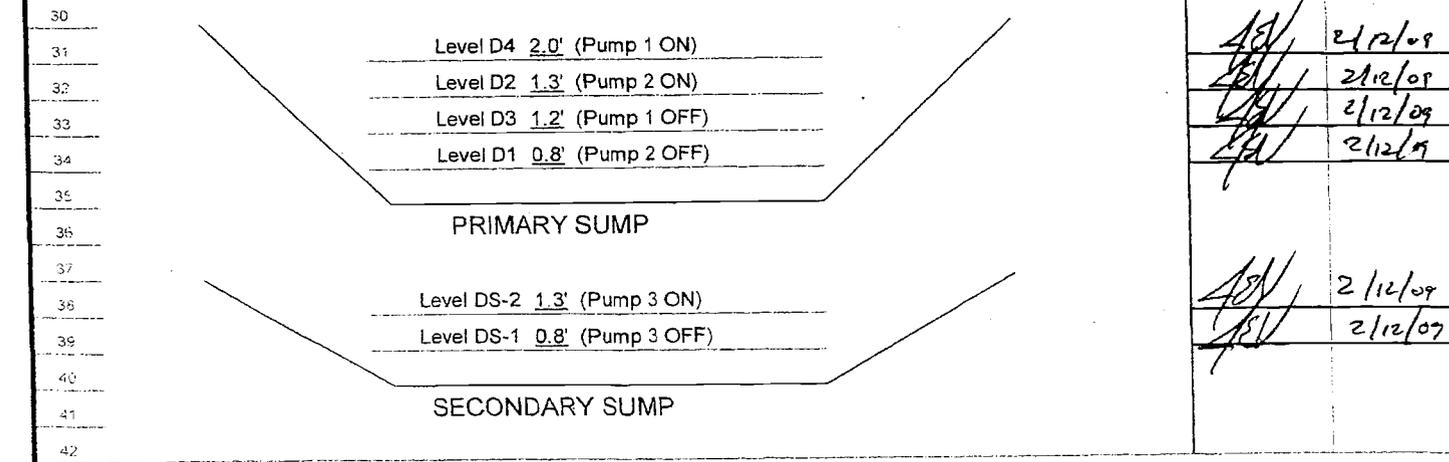
1	Notes:		
2	1. In the interest of continuation of testing, portions of this procedure may be redlined		
3	and initialed in the field during testing with concurrence from the Test Director.		
4			
5	2. Referenced status lights, switches, level indicators, meter readouts, and indicator		
6	lights are located in the Crest Pad Building except as indicated by [location]		

7	Prerequisites:		
8	Review applicable IWCP work documents (work package or technical procedures)	<i>JAL</i>	2/12/09
9	The system to be tested has been inspected for workmanship and compliance with design	<i>JAL</i>	2/12/09
10	Continuity tests have been performed on the electrical wiring of the systems	<i>JAL</i>	2/12/09
11	Continuity tests have been performed on the instrumentation wiring of the systems	<i>JAL</i>	2/12/09
12	Motor overload devices are sized (or set) correctly based on motor nameplate data	<i>JAL</i>	2/12/09
13	Power is available	<i>JAL</i>	2/12/09
14	Safety requirements have been implemented in accordance with the IWCP work document	<i>JAL</i>	2/12/09
15	A dry run of this test has been completed to demonstrate the system operates as specified	<i>JAL</i>	2/12/09
16	Configure valves to route pump discharge through the bypass pipeline	<i>JAL</i>	2/12/09

17			
18	SUBCONTRACTOR furnished Testing Equipment:		
19	Flow Meter/Totalizer for measuring water added by SUBCONTRACTOR to the Sumps		
20	Meter Manufacturer/Model: <u>Blue-White</u>		
21	Calibration Expiration Date: <u>11/15/09</u>		
22	ID No. <u>TB-200M1-6PMY</u>		

23			
24	Volt/Current Meter:		
25	Meter Manufacturer/Model: <u>FUUKF 336</u>		
26	Calibration Expiration Date: <u>4/4/08</u>		
27	ID No. <u>84156509</u>		
28	<u>84156506</u> <i>to</i> 2/12/09		

29 Verify that the sump transducers levels are set to the following levels:



Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7 / Cell 8
 System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
 Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
42a	<u>On the "FLOW TRANSMITTER PANEL":</u>		
42b	Initial "PUMP 1" flow meter totalizer reading (gallons) <u>0</u>	<u>AW</u>	<u>2/12/09</u>
42c	Initial "PUMP 2" flow meter totalizer reading (gallons) <u>0</u>	<u>AW</u>	<u>2/12/09</u>
42d	Initial "PUMP 3" flow meter totalizer reading (gallons) <u>0</u>	<u>AW</u>	<u>2/12/09</u>
42e			
43	Primary Sump level is pumped to less 0.8' level Sump Level: <u>0.75</u>	<u>AW</u>	<u>2/12/09</u>
44	Secondary Sump level is pumped to less 0.8' level Sump Level: <u>0.77</u>	<u>AW</u>	<u>2/12/09</u>
45			
46	Configure the Control System for the test:		
47	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
48	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	<u>AW</u>	<u>2/12/09</u>
49	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	<u>AW</u>	<u>2/12/09</u>
50	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	<u>AW</u>	<u>2/12/09</u>
51	Switch the roof "ROOF ALARM HAND-OFF-AUTO" switch to the "AUTO" position	<u>AW</u>	<u>2/12/09</u>
52	Switch the "CONTROL POWER ON/OFF" switch to the "ON" position	<u>AW</u>	<u>2/12/09</u>
53			
54	Verify the "PUMP 1 FAILURE" indicator light is off	<u>AW</u>	<u>2/12/09</u>
55	Verify the "PUMP 1 LOW/OFF" indicator light is on (sump level is < 1.2')	<u>AW</u>	<u>2/12/09</u>
56	Verify the "PUMP 1 HIGH/START" indicator light is off	<u>AW</u>	<u>2/12/09</u>
57	Verify the "PUMP 1 RUN" indicator light is off	<u>AW</u>	<u>2/12/09</u>
58			
59	Verify the "PUMP 2 FAILURE" indicator light is off	<u>AW</u>	<u>2/12/09</u>
60	Verify the "PUMP 2 LOW/OFF" indicator light is on (sump level is < 0.8')	<u>AW</u>	<u>2/12/09</u>
61	Verify the "PUMP 2 HIGH/START" indicator light is off	<u>AW</u>	<u>2/12/09</u>
62	Verify the "PUMP 2 RUN" indicator light is off	<u>AW</u>	<u>2/12/09</u>
63			
64	Verify the "PUMP 3 FAILURE" indicator light is off	<u>AW</u>	<u>2/12/09</u>
65	Verify the "PUMP 3 LOW/OFF" indicator light is on (if sump level is < 0.8')	<u>AW</u>	<u>2/12/09</u>
66	Verify the "PUMP 3 HIGH/START" indicator light is off	<u>AW</u>	<u>2/12/09</u>
67	Verify the "PUMP 3 RUN" indicator light is off	<u>AW</u>	<u>2/12/09</u>
68			
69	Verify the "TANK HIGH" indicator light is off	<u>AW</u>	<u>2/12/09</u>
70	Verify the "ALARM" indicator light is off	<u>AW</u>	<u>2/12/09</u>
71			
72	<u>At the Crest Pad Building Motor Control Center (MCC):</u>		
73	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	<u>AW</u>	<u>2/12/09</u>
74	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	<u>AW</u>	<u>2/12/09</u>
75	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	<u>AW</u>	<u>2/12/09</u>
76			
77	<u>In the Crest Pad Building Mechanical Room:</u>		
78	Switch the PUMP 1 disconnect switch to the "ON" position	<u>AW</u>	<u>2/12/09</u>
79	Switch the PUMP 2 disconnect switch to the "ON" position	<u>AW</u>	<u>2/12/09</u>
80	Switch the PUMP 3 disconnect switch to the "ON" position	<u>AW</u>	<u>2/12/09</u>
81			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
Flood Switches, and Controls Date 2/11/09

Line No.	Activity	Documented By	Completed Date
82	<u>On the Leachate System Control Computer in [MO-481]:</u>		
83	Verify there is not a PUMP 1 fail alarm	<i>AEV</i>	2/12/09
84	Verify PUMP 1 is not running (motor is red)	<i>AEV</i>	2/12/09
85			
86	Verify there is not a PUMP 2 fail alarm	<i>AEV</i>	2/12/09
87	Verify PUMP 2 is not running (motor is red)	<i>AEV</i>	2/12/09
88			
89	Verify there is not a PUMP 3 fail alarm	<i>AEV</i>	2/12/09
90	Verify PUMP 3 is not running (motor is red)	<i>AEV</i>	2/12/09
91			
92	Verify there not any "HIGH HIGH TANK" alarms	<i>AEV</i>	2/12/09
93	Verify there is not a Cell 7 Manhole FLOOD ALARM	<i>AEV</i>	2/12/09
94	Verify there is not a Cell 8 Manhole FLOOD ALARM	<i>AEV</i>	2/12/09
95			
96	DEMONSTRATE SYSTEM OPERATION AT EACH "PRIMARY SUMP" LEVEL:		
97	Fill Primary Sump to Water Level D1:		
98	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
99	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>0.75</u>	<i>AEV</i>	2/12/09
100			
101	<u>On SUBCONTRACTOR provided test Equipment:</u>		
102	Initial flow totalizer reading (gallons) <u>0</u>	<i>AEV</i>	2/12/09
103			
104	<u>On the Leachate System Control Computer in [MO-481]:</u>		
105	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>0.74</u>	<i>AEV</i>	2/12/09
106			
107	Add water to the primary sump until the "PRIMARY SUMP LEVEL"		
108	is above the D1 (0.8') level and below the D3 (1.2') level.	<i>AEV</i>	2/12/09
109			
110	<u>On the "TRENCH PUMP CONTROL PANEL":</u>	<i>AEV</i> 2/12/09	
111	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>0.84 0.82</u>	<i>AEV</i>	2/12/09
112			
113	<u>On SUBCONTRACTOR provided test Equipment:</u>		
114	Final flow totalizer reading (gallons) <u>213</u> Total added (gallons): <u>213</u>	<i>AEV</i>	2/12/09
115			
116	<u>On the Leachate System Control Computer in [MO-481]:</u>		
117	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>0.84</u>	<i>AEV</i>	2/12/09
118			
119	Verify PUMP 1 Operation:		
120	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
121	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	<i>AEV</i>	2/12/09
122	Verify that "PUMP 1" does not start	<i>AEV</i>	2/12/09
123	Verify the "PUMP 1 FAILURE" indicator light is off	<i>AEV</i>	2/12/09
124	Verify the "PUMP 1 LOW/OFF" indicator light is on	<i>AEV</i>	2/12/09
125	Verify the "PUMP 1 HIGH/START" indicator light is off	<i>AEV</i>	2/12/09

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as Rev. _____
Flood Switches, and Controls specified Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
126	Verify the "PUMP 1 RUN" indicator light is off	JEV	2/12/09
127			
128	<u>On the Leachate System Control Computer in [MO-481]:</u>		
129	Verify there is not a PUMP 1 fail alarm	JEV	2/12/09
130	Verify PUMP 1 is not running (motor is red)	JEV	2/12/09
131			
132	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
133	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	JEV	2/12/09
134			
135	Verify PUMP 2 Operation:		
136	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
137	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	JEV	2/12/09
138	Verify that "PUMP 2" does not start	JEV	2/12/09
139	Verify the "PUMP 2 FAILURE" indicator light is off	JEV	2/12/09
140	Verify the "PUMP 2 LOW/OFF" indicator light is off	JEV	2/12/09
141	Verify the "PUMP 2 HIGH/START" indicator light is off	JEV	2/12/09
142	Verify the "PUMP 2 RUN" indicator light is off	JEV	2/12/09
143			
144	<u>On the Leachate System Control Computer in [MO-481]:</u>		
145	Verify there is not a PUMP 2 fail alarm	JEV	2/12/09
146	Verify PUMP 2 is not running (motor is red)	JEV	2/12/09
147			
148	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
149	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	JEV	2/12/09
150			
151	Fill Primary Sump to Water Level D3:		
152	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
153	Initial "PRIMARY SUMP LEVEL" reading (Feet) 0.82	JEV	2/12/09
154			
155	<u>On SUBCONTRACTOR provided test Equipment:</u>		
156	Initial flow totalizer reading (gallons) 213	JEV	2/12/09
157			
158	<u>On the Leachate System Control Computer in [MO-481]:</u>		
159	Initial "PRIMARY SUMP LEVEL" reading (Feet) 0.84	JEV	2/12/09
160			
161	Add water to the primary sump until the "PRIMARY SUMP LEVEL"		
162	is above the D3 (1.2') level and below the D2 (1.3') level.	JEV	2/12/09
163			
164	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
165	Final "PRIMARY SUMP LEVEL" reading (Feet) 1.21	JEV	2/12/09
166			
167	<u>On SUBCONTRACTOR provided test Equipment:</u>		
168	Final flow totalizer reading (gallons) 2211 Total added (gallons): 1998	JEV	2/12/09
169			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7/ Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
Flood Switches, and Controls Date 2/11/09

Line No.	Activity	Documented By	Completed Date
170	On the Leachate System Control Computer in [MO-481]:		
171	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>1.21</u>	<u>ASU</u>	<u>2/12/09</u>
172			
173	Verify PUMP 1 Operation:		
174	On the "TRENCH PUMP CONTROL PANEL":		
175	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	<u>ASU</u>	<u>2/12/09</u>
176	Verify that "PUMP 1" does not start	<u>ASU</u>	<u>2/12/09</u>
177	Verify the "PUMP 1 FAILURE" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
178	Verify the "PUMP 1 LOW/OFF" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
179	Verify the "PUMP 1 HIGH/START" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
180	Verify the "PUMP 1 RUN" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
181			
182	On the Leachate System Control Computer in [MO-481]:		
183	Verify there is not a PUMP 1 fail alarm	<u>ASU</u>	<u>2/12/09</u>
184	Verify PUMP 1 is not running (motor is red)	<u>ASU</u>	<u>2/12/09</u>
185			
186	On the "TRENCH PUMP CONTROL PANEL":		
187	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	<u>ASU</u>	<u>2/12/09</u>
188			
189	Verify PUMP 2 Operation:		
190	On the "TRENCH PUMP CONTROL PANEL":		
191	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	<u>ASU</u>	<u>2/12/09</u>
192	Verify that "PUMP 2" does not start	<u>ASU</u>	<u>2/12/09</u>
193	Verify the "PUMP 2 FAILURE" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
194	Verify the "PUMP 2 LOW/OFF" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
195	Verify the "PUMP 2 HIGH/START" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
196	Verify the "PUMP 2 RUN" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
197			
198	On the Leachate System Control Computer in [MO-481]:		
199	Verify there is not a PUMP 2 fail alarm	<u>ASU</u>	<u>2/12/09</u>
200	Verify PUMP 2 is not running (motor is red)	<u>ASU</u>	<u>2/12/09</u>
201			
202	On the "TRENCH PUMP CONTROL PANEL":		
203	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	<u>ASU</u>	<u>2/12/09</u>
204			
205	Fill Primary Sump to Water Level D2:		
206	On the "TRENCH PUMP CONTROL PANEL":		
207	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>1.21</u>	<u>ASU</u>	<u>2/12/09</u>
208			
209	On SUBCONTRACTOR provided test Equipment:		
210	Initial flow totalizer reading (gallons) <u>2211</u>	<u>ASU</u>	<u>2/12/09</u>
211			
212	On the Leachate System Control Computer in [MO-481]:		
213	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>1.21</u>	<u>ASU</u>	<u>2/12/09</u>

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
 Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
214			
215	Add water to the primary sump until the "PRIMARY SUMP LEVEL"		
216	is above the D2 (1.3") level and below the D4 (2.0') level.	<i>ASU</i>	2/12/09
217			
218	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
219	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>1.30</u>	<i>ASU</i>	2/12/09
220			
221	<u>On SUBCONTRACTOR provided test Equipment:</u>		
222	Final flow totalizer reading (gallons) <u>228 2894</u> Total added (gallons): <u>683</u>	<i>ASU</i>	2/12/09
223	<u>ASU 2/12/09</u>		
224	<u>On the Leachate System Control Computer in [MO-481]:</u>		
225	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>1.30</u>	<i>ASU</i>	2/12/09
226			
227	Verify PUMP 1 Operation:		
228	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
229	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	<i>ASU</i>	2/12/09
230	Verify that "PUMP 1" does not start	<i>ASU</i>	2/12/09
231	Verify the "PUMP 1 FAILURE" indicator light is off	<i>ASU</i>	2/12/09
232	Verify the "PUMP 1 LOW/OFF" indicator light is off	<i>ASU</i>	2/12/09
233	Verify the "PUMP 1 HIGH/START" indicator light is off	<i>ASU</i>	2/12/09
234	Verify the "PUMP 1 RUN" indicator light is off	<i>ASU</i>	2/12/09
235			
236	<u>On the Leachate System Control Computer in [MO-481]:</u>		
237	Verify there is not a PUMP 1 fail alarm	<i>ASU</i>	2/12/09
238	Verify PUMP 1 is not running (motor is red)	<i>ASU</i>	2/12/09
239			
240	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
241	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	<i>ASU</i>	2/12/09
242			
243	Verify PUMP 2 Operation:		
244	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
245	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	<i>ASU</i>	2/12/09
246	Verify that "PUMP 2" starts	<i>ASU</i>	2/12/09
247	Verify the "PUMP 2 FAILURE" indicator light is off	<i>ASU</i>	2/12/09
248	Verify the "PUMP 2 LOW/OFF" indicator light is off	<i>ASU</i>	2/12/09
249	Verify the "PUMP 2 HIGH/START" indicator light is on	<i>ASU</i>	2/12/09
250	Verify the "PUMP 2 RUN" indicator light is on	<i>ASU</i>	2/12/09
251			
252	<u>On the Leachate System Control Computer in [MO-481]:</u>		
253	Verify PUMP 2 is running (motor is green)	<i>ASU</i>	2/12/09
254			
255	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
256	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	<i>ASU</i>	2/12/09
257			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/ Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
Flood Switches, and Controls Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
258	Fill Primary Sump to Water Level D4:		
259	On the "TRENCH PUMP CONTROL PANEL":		
260	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>1.30</u>	<u>ASU</u>	<u>2/12/09</u>
261			
262	On SUBCONTRACTOR provided test Equipment:		
263	Initial flow meter reading (gallons) <u>2894</u>	<u>ASU</u>	<u>2/12/09</u>
264			
265	On the Leachate System Control Computer in [MO-481]:		
266	Initial "PRIMARY SUMP LEVEL" reading (Feet) <u>1.30</u>	<u>ASU</u>	<u>2/12/09</u>
267			
268	Add water to the primary sump until the "PRIMARY SUMP LEVEL"		
269	is above the D4 (2.0') level.	<u>ASU</u>	<u>2/12/09</u>
270			
271	On the "TRENCH PUMP CONTROL PANEL":		
272	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>2.25</u>	<u>ASU</u>	<u>2/12/09</u>
273			
274	On SUBCONTRACTOR provided test Equipment:		
275	Final flow totalizer reading (gallons) <u>9673</u> Total added (gallons): <u>6779</u>	<u>ASU</u>	<u>2/12/09</u>
276			
277	On the Leachate System Control Computer in [MO-481]:		
278	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>2.25</u>	<u>ASU</u>	<u>2/12/09</u>
279			
280	Verify PUMP 1 Operation:		
281	On the "TRENCH PUMP CONTROL PANEL":		
282	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	<u>ASU</u>	<u>2/12/09</u>
283	Verify that "PUMP 1" starts	<u>ASU</u>	<u>2/12/09</u>
284	Verify the "PUMP 1 FAILURE" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
285	Verify the "PUMP 1 LOW/OFF" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
286	Verify the "PUMP 1 HIGH/START" indicator light is on	<u>ASU</u>	<u>2/12/09</u>
287	Verify the "PUMP 1 RUN" indicator light is on	<u>ASU</u>	<u>2/12/09</u>
288			
289	On the Leachate System Control Computer in [MO-481]:		
290	Verify PUMP 1 is running (motor is green)	<u>ASU</u>	<u>2/12/09</u>
291			
292	On the "TRENCH PUMP CONTROL PANEL":		
293	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position <u>10:43</u>	<u>ASU</u>	<u>2/12/09</u>
294			
295	Verify PUMP 2 Operation:		
296	On the "TRENCH PUMP CONTROL PANEL":		
297	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	<u>ASU</u>	<u>2/12/09</u>
298	Verify that "PUMP 2" starts	<u>ASU</u>	<u>2/12/09</u>
299	Verify the "PUMP 2 FAILURE" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
300	Verify the "PUMP 2 LOW/OFF" indicator light is off	<u>ASU</u>	<u>2/12/09</u>
301	Verify the "PUMP 2 HIGH/START" indicator light is on	<u>ASU</u>	<u>2/12/09</u>

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev.
 Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
302	Verify the "PUMP 2 RUN" indicator light is on	ASU	2/12/09
303			
304	<u>On the Leachate System Control Computer in [MO-481]:</u>		
305	Verify PUMP 2 is running (motor is green)	ASU	2/12/09
306			
307	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
308	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASU	2/12/09
309			
310	DEMONSTRATE SYSTEM OPERATION AT EACH "SECONDARY SUMP" LEVEL:		
311	Configure Pump Discharge:		
312	Configure valves on pump discharge pipelines to route pump discharge		
313	through the bypass pipeline.	ASU	2/12/09
314			
315	Fill Secondary Sump to Water Level DS-1:		
316	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
317	Initial "SECONDARY SUMP LEVEL" reading (Feet) <u>0.77</u>	ASU	2/12/09
318			
319	<u>On SUBCONTRACTOR provided test Equipment:</u>		
320	Initial flow meter reading (gallons) <u>9673</u>	ASU	2/12/09
321			
322	<u>On the Leachate System Control Computer in [MO-481]:</u>		
323	Initial "SECONDARY SUMP LEVEL" reading (Feet) <u>0.74</u>	ASU	2/12/09
324			
325	Add water to the secondary sump until the "SECONDARY SUMP LEVEL"		
326	is above the DS-1 (0.8') level and below the DS-2 (1.3') level.	ASU	2/12/09
327			
328	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
329	Final "SECONDARY SUMP LEVEL" reading (Feet) <u>1.29</u>	ASU	2/12/09
330			
331	<u>On SUBCONTRACTOR provided test Equipment:</u>		
332	Final flow meter reading (gallons) <u>SEE EXCEPTION CELL 8-01</u> Total added (gallons): <u>946</u>	ASU	2/12/09
333			
334	<u>On the Leachate System Control Computer in [MO-481]:</u>		
335	Final "SECONDARY SUMP LEVEL" reading (Feet) <u>1.28</u>	ASU	2/12/09
336			
337	Verify PUMP 3 Operation:		
338	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
339	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	ASU	2/12/09
340	Verify that "PUMP 3" does not start	ASU	2/12/09
341	Verify the "PUMP 3 FAILURE" indicator light is off	ASU	2/12/09
342	Verify the "PUMP 3 LOW/OFF" indicator light is off	ASU	2/12/09
343	Verify the "PUMP 3 HIGH/START" indicator light is off	ASU	2/12/09
344	Verify the "PUMP 3 RUN" indicator light is off	ASU	2/12/09
345			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified
Flood Switches, and Controls

Location Cell 7/Cell 8
 Rev. _____
 Date 2/11/09

Line No.	Activity	Documented By	Completed Date
346	On the Leachate System Control Computer in [MO-481]:		
347	Verify there is not a PUMP 3 fail alarm	ASW	2/12/09
348	Verify PUMP 3 is not running (motor is red)	ASW	2/12/09
349			
350	On the "TRENCH PUMP CONTROL PANEL":		
351	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASW	2/12/09
352			
353	Fill Secondary Sump to Water Level DS-2:		
354	On the "TRENCH PUMP CONTROL PANEL":	ASW	2/12/09
355	Initial "SECONDARY SUMP LEVEL" reading (Feet) <u>+29 0.77</u>	ASW	2/12/09
356			
357	On SUBCONTRACTOR provided test Equipment:		
358	Initial flow meter reading (gallons) <u>9673</u>	ASW	2/12/09
359			
360	On the Leachate System Control Computer in [MO-481]:	ASW	2/12/09
361	Initial "SECONDARY SUMP LEVEL" reading (Feet) <u>+28 0.74</u>	ASW	2/12/09
362			
363	Add water to the secondary sump until the "SECONDARY SUMP LEVEL"		
364	is above the DS-2 (1.3') level.	ASW	2/12/09
365			
366	On the "TRENCH PUMP CONTROL PANEL":		
367	Final "SECONDARY SUMP LEVEL" reading (Feet) <u>1.38</u>	ASW	2/12/09
368			
369	On SUBCONTRACTOR provided test Equipment:		
370	Final flow meter reading (gallons) <u>10745</u> Total added (gallons): <u>1072</u>	ASW	2/12/09
371			
372	On the Leachate System Control Computer in [MO-481]:		
373	Final "SECONDARY SUMP LEVEL" reading (Feet) <u>1.37</u>	ASW	2/12/09
374			
375	Verify PUMP 3 Operation:		
376	On the "TRENCH PUMP CONTROL PANEL":		
377	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	ASW	2/12/09
378	Verify that "PUMP 3" starts	ASW	2/12/09
379	Verify the "PUMP 3 FAILURE" indicator light is off	ASW	2/12/09
380	Verify the "PUMP 3 LOW/OFF" indicator light is off	ASW	2/12/09
381	Verify the "PUMP 3 HIGH/START" indicator light is on	ASW	2/12/09
382	Verify the "PUMP 3 RUN" indicator light is on	ASW	2/12/09
383			
384	On the Leachate System Control Computer in [MO-481]:		
385	Verify there is not a PUMP 3 fail alarm	ASW	2/12/09
386	Verify PUMP 3 is running (motor is green)	ASW	2/12/09
387			
388	On the "TRENCH PUMP CONTROL PANEL":		
389	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASW	2/12/09

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7 / Cell 8
 System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 2/11/09
 Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
390			
391	DEMONSTRATE MANHOLE FLOOD SHUTDOWN:		
392	Configure the Control System for the test:		
393	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"		
394	is just above the D-4 (2.0') level.	N/A	N/A
395			
396	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
397	Final "PRIMARY SUMP LEVEL" reading (Feet) <u>2.21</u>	ASU	2/12/09
398			
399	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"		
400	is just above the DS-2 (2.0 1.3') level.	N/A	N/A
401			
402	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
403	Final "SECONDARY SUMP LEVEL" reading (Feet) <u>1.38</u>	ASU	2/12/09
404			
405	<u>In Manhole MH-30 (Cell 7) / MH-31 (Cell 8) (circle MH being tested):</u>		
406	Switch the MH Flood detector disconnect switch to the "ON" position DELETE	ASU	2/12/09
407	<i>NOTE: No disconnect switches in MH-31</i>	ASU 2/12/09 WAB 2/23/09 BH 2/23/09 ASU 2/23/09	
408	<u>On the Roof of the Crest Pad Building:</u>		
409	Verify the roof alarm beacon outside of the crest pad building is off	ASU	2/12/09
410			
411	<u>On the Leachate System Control Computer in [MO-481]:</u>		
412	Verify there is not a Cell 7 / Cell 8 (circle cell tested) Manhole FLOOD ALARM	ASU	2/12/09
413			
414	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
415	Verify at least 10 minutes have elapsed since Pump 1 was shut down <u>11:08</u>	ASU	2/12/09
416	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND" position	ASU	2/12/09
417	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND" position	ASU	2/12/09
418	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND" position	ASU	2/14/09
419			
420	<u>Simulate a Flood in Manhole MH-30 (Cell 7) / MH-31 (Cell 8) (circle MH being tested):</u>		
421	While PUMP 1, PUMP 2, and PUMP 3 are running, Slowly place the flood alarm switch		
422	into a container of water	ASU	2/12/09
423			
424	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
425	Verify that "PUMP 1" stops	ASU	2/12/09
426	Verify the "PUMP 1 LOW/OFF" indicator light is off	ASU	2/12/09
427	Verify the "PUMP 1 HIGH/START" indicator light is on	ASU	2/12/09
428	Verify the "PUMP 1 RUN" indicator light is off	ASU	2/12/09
429			
430	Verify that "PUMP 2" stops	ASU	2/12/09
431	Verify the "PUMP 2 LOW/OFF" indicator light is off	ASU	2/12/09
432	Verify the "PUMP 2 HIGH/START" indicator light is on	ASU	2/12/09
433	Verify the "PUMP 2 RUN" indicator light is off	ASU	2/12/09

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers, Flood Switches, and Controls Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
 Date 2/11/09

Line No.	Activity	Documented By	Completed Date
434			
435	Verify that "PUMP 3" stops	ASU	2/12/09
436	Verify the "PUMP 3 LOW/OFF" indicator light is off	ASU	2/12/09
437	Verify the "PUMP 3 HIGH/START" indicator light is on	ASU	2/12/09
438	Verify the "PUMP 3 RUN" indicator light is off	ASU	2/12/09
439			
440	Verify the "ALARM" indicator is on	ASU	2/12/09
441			
442	<u>On the Leachate System Control Computer in [MO-481]:</u>		
443	Verify there is a Cell 7 (Cell 8 (circle cell tested) Manhole FLOOD ALARM	ASU	2/12/09
444	Verify PUMP 1 is not running (motor is red)	ASU	2/12/09
445	Verify PUMP 1 is not running (motor is red)	ASU	2/12/09
446	Verify PUMP 3 is not running (motor is red)	ASU	2/12/09
447	Verify the Auto-dialer begins calling	ASU	2/12/09
448			
449	<u>On the Roof of the Crest Pad Building:</u>		
450	Verify the roof alarm beacon outside of the crest pad building is on	ASU	2/12/09
451			
452	Remove the water from the MH flood switch	ASU	2/12/09
453			
454	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
455	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASU	2/12/09
456	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASU	2/12/09
457	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASU	2/12/09
458	→ MOVED TO LINE 458 AD 2/12/09 WAB 2/23/09		
459	<u>On the Leachate System Control Computer in [MO-481]:</u> RH 2/23/09		
460	Acknowledge the Manhole FLOOD alarm	ASU	2/12/09
461			
462	DEMONSTRATE HIGH TANK SHUTDOWN		
463	Verify HIGH Leachate Storage Tank Levels Shutdown PUMP 1, PUMP 2, & PUMP 3:		
464	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"		
465	is just above the D-4 (2.0') level.	N/A	N/A
466			
467	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
468	Final "PRIMARY SUMP LEVEL" reading (Feet) 2.17	ASU	2/12/09
469			
470	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"		
471	is just above the DS-2 (1.3 2.0') level.	N/A	N/A
472			
473	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
474	Final "SECONDARY SUMP LEVEL" reading (Feet) 1.37	ASU	2/12/09
475			
476	<u>On the Roof of the Crest Pad Building:</u>		
477	Verify the roof alarm beacon outside of the crest pad building is off	ASU	2/12/09

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7, Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
Flood Switches, and Controls Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
478			
479	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
480	Verify at least 10 minutes have elapsed since Pump 1 was shut down 11:29	<i>ASV</i>	2/12/09
481	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND" position	<i>ASV</i>	2/12/09
482	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND" position	<i>ASV</i>	2/12/09
483	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND" position	<i>ASV</i>	2/12/09
484			
485	<u>Introduce a High Tank Level signal</u>		
486	While PUMP 1, PUMP 2, and PUMP 3 are running, simulate high water levels in the		
487	Leachate Storage Tanks	<i>ASV</i>	2/12/09
488			
489	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
490	Verify that "PUMP 1" stops	<i>ASV</i>	2/12/09
491	Verify the "PUMP 1 LOW/OFF" indicator light is off	<i>ASV</i>	2/12/09
492	Verify the "PUMP 1 HIGH/START" indicator light is on	<i>ASV</i>	2/12/09
493	Verify the "PUMP 1 RUN" indicator light is off	<i>ASV</i>	
494			
495	Verify that "PUMP 2" stops	<i>ASV</i>	2/12/09
496	Verify the "PUMP 2 LOW/OFF" indicator light is off	<i>ASV</i>	2/12/09
497	Verify the "PUMP 2 HIGH/START" indicator light is on	<i>ASV</i>	2/12/09
498	Verify the "PUMP 2 RUN" indicator light is off	<i>ASV</i>	2/12/09
499			
500	Verify that "PUMP 3" stops	<i>ASV</i>	2/12/09
501	Verify the "PUMP 3 LOW/OFF" indicator light is off	<i>ASV</i>	2/12/09
502	Verify the "PUMP 3 HIGH/START" indicator light is on	<i>ASV</i>	2/12/09
503	Verify the "PUMP 3 RUN" indicator light is off	<i>ASV</i>	2/12/09
504			
505	Verify the "TANK HIGH" indicator is on	<i>ASV</i>	2/12/09
506	Verify the "ALARM" indicator is on off	<i>ASV</i>	2/12/09
507			
508	<u>On the Leachate System Control Computer in [MO-481]:</u>		
509	Verify there is a HIGH HIGH TANK alarm		see Exception CELL7-01
510	Verify PUMP 1 is not running (motor is red)	<i>ASV</i>	2/12/09
511	Verify PUMP 2 is not running (motor is red)	<i>ASV</i>	2/12/09
512	Verify PUMP 3 is not running (motor is red)	<i>ASV</i>	2/12/09
513	Verify the Auto-dialer begins calling		see Exception CELL7-01
514			
515	<u>On the Roof of the Crest Pad Building:</u>		
516	Verify the roof alarm beacon outside of the crest pad building is on	<i>ASV</i>	2/12/09
517	<i>NOTE: Roof Alarm beacon lights</i>	<i>ASV</i>	2/12/09
518	Remove the High Tank Level signal <i>does not light on High High Tank Alarm</i>		(moved this item to Line 525b)
519			

ASV 2/12/09
WAB 2/24/09
RH 2/23/09

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location	Cell 7/Cell 8
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls		Purpose:	Demonstrate that the Leachate System operates as specified
				Rev.	Date
					2/11/09
Line No.	Activity	Documented By	Completed Date		
520	On the "TRENCH PUMP CONTROL PANEL":				
521	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/12/09		
522	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/12/09		
523	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASV	2/12/09		
524	Record "PRIMARY SUMP LEVEL" reading (Feet)	ASV	2.16	2/12/09	
524a	Record "SECONDARY SUMP LEVEL" reading (Feet)	ASV	1.36	2/12/09	
525	Reset the HIGH TANK alarm	ASV		2/12/09	
525a					
525b	Remove the High Tank Level signal	ASV		2/12/09	
526					
527	On the Leachate System Control Computer in [MO-481]:				
528	Acknowledge the HIGH HIGH TANK alarm			see Exception CELL7-01	
529					
530	DEMONSTRATE PUMP "FAIL" OPERATION:				
531	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"				
532	is just above the D-4 (2.0') level.	N/A		N/A	
533					
534	On the "TRENCH PUMP CONTROL PANEL":				
535	Final "PRIMARY SUMP LEVEL" reading (Feet)	ASV	2.16	2/12/09	
536					
537	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"				
538	is just above the DS-2 (2-0 1.3') level.	N/A		N/A	
539					
540	On the "TRENCH PUMP CONTROL PANEL":				
541	Final "SECONDARY SUMP LEVEL" reading (Feet)	ASV	1.36	2/12/09	
542					
543	On the "TRENCH PUMP CONTROL PANEL":				
544	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASV		2/12/09	
545	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASV		2/12/09	
546	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASV		2/12/09	
547					
548	At the Crest Pad Building Motor Control Center (MCC):				
549	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASV		2/12/09	
550	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	ASV		2/12/09	
551	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	ASV		2/12/09	
552					
553	On the "FLOW TRANSMITTER PANEL":				
554	Initial "PUMP 1" flow meter totalizer reading (gallons)	ASV	622.0	2/12/09	
555	Initial "PUMP 2" flow meter totalizer reading (gallons)	ASV	73.2	2/12/09	
556	Initial "PUMP 3" flow meter totalizer reading (gallons)	ASV	133.9	2/12/09	
557					

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/ Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
Flood Switches, and Controls Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
568	Verify PUMP 1 Alarms:		
569	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
560	Verify the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	ASU	2/12/09
561	Verify the "PUMP 1 FAILURE" indicator light is on	ASU	2/12/09
562	Verify the "PUMP 1 LOW/OFF" indicator light is off	ASU	2/12/09
563	Verify the "PUMP 1 HIGH/START" indicator light is on	ASU	2/12/09
564	Verify the "PUMP 1 RUN" indicator light is off	ASU	2/12/09
565	Verify the "ALARM" indicator is on	ASU	2/12/09
566			
567	<u>On the Roof of the Crest Pad Building:</u>		
568	Verify the roof light outside of the crest pad building is on	ASU	2/12/09
569			
570	<u>On the Leachate System Control Computer in [MO-481]:</u>		
571	Verify there is a PUMP 1 fail alarm	ASU	2/12/09
572	Verify PUMP 1 is not running (motor is yellow red)	ASU	2/12/09
573	Verify autodialer begins calling	ASU	2/12/09
574			
575	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
576	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	ASU	2/12/09
577	Verify the "PUMP 1 FAILURE" indicator is off	ASU	2/12/09
578	Verify the "PUMP 1 LOW/OFF" indicator is off	ASU	2/12/09
579	Verify the "PUMP 1 HIGH/START" indicator is on	ASU	2/12/09
580	Verify the "PUMP 1 RUN" indicator is off	ASU	2/12/09
581	Verify the Crest Pad Building "ALARM" indicator is off	ASU	2/12/09
582			
583	<u>On the Roof of the Crest Pad Building:</u>		
584	Verify the roof light outside of the crest pad building is off	ASU	2/12/09
585			
586	<u>On the Leachate System Control Computer in [MO-481]:</u>		
587	Acknowledge PUMP 1 fail alarm	ASU	2/12/09
588			
589	Verify PUMP 2 Alarms:		
590	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
591	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	ASU	2/12/09
592	Verify the "PUMP 2 FAILURE" indicator light is on	ASU	2/12/09
593	Verify the "PUMP 2 LOW/OFF" indicator light is off	ASU	2/12/09
594	Verify the "PUMP 2 HIGH/START" indicator light is on	ASU	2/12/09
595	Verify the "PUMP 2 RUN" indicator light is off	ASU	2/12/09
596	Verify the "ALARM" indicator is on	ASU	2/12/09
597			
598	<u>On the Roof of the Crest Pad Building:</u>		
599	Verify the roof light outside of the crest pad building is on	ASU	2/12/09
600			

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form	Location	Cell 7/Cell 8
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls	Rev.	1
		Purpose: specified	Date	2/11/09
Line No.	Activity	Documented By	Completed Date	
601	<u>On the Leachate System Control Computer in [MO-481]:</u>			
602	Verify there is a PUMP 2 fail alarm	AEV	2/12/09	
603	Verify PUMP 2 is not running (motor is yellow red)	AEV	2/12/09	
604	Verify autodialer begins calling	AEV	2/12/09	
605				
606	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
607	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/12/09	
608	Verify the "PUMP 2 FAILURE" indicator is off	AEV	2/12/09	
609	Verify the "PUMP 2 LOW/OFF" indicator is off	AEV	2/12/09	
610	Verify the "PUMP 2 HIGH/START" indicator is on	AEV	2/12/09	
611	Verify the "PUMP 2 RUN" indicator is off	AEV	2/12/09	
612	Verify the Crest Pad Building "ALARM" indicator is off	AEV	2/12/09	
613				
614	<u>On the Roof of the Crest Pad Building:</u>			
615	Verify the roof light outside of the crest pad building is off	AEV	2/12/09	
616				
617	<u>On the Leachate System Control Computer in [MO-481]:</u>			
618	Acknowledge PUMP 2 fail alarm	AEV	2/12/09	
619				
620	Verify PUMP 3 Alarms:			
621	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
622	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	AEV	2/12/09	
623	Verify the "PUMP 3 FAILURE" indicator light is on	AEV	2/12/09	
624	Verify the "PUMP 3 LOW/OFF" indicator light is off	AEV	2/12/09	
625	Verify the "PUMP 3 HIGH/START" indicator light is on	AEV	2/12/09	
626	Verify the "PUMP 3 RUN" indicator light is off	AEV	2/12/09	
627	Verify the "ALARM" indicator is on	AEV	2/12/09	
628				
629	<u>On the Roof of the Crest Pad Building:</u>			
630	Verify the roof light outside of the crest pad building is on	AEV	2/12/09	
631				
632	<u>On the Leachate System Control Computer in [MO-481]:</u>			
633	Verify there is a PUMP 3 fail alarm	AEV	2/12/09	
634	Verify PUMP 3 is not running (motor is yellow red)	AEV	2/12/09	
635	Verify autodialer begins calling	AEV	2/12/09	
636				
637	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
638	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/12/09	
639	Verify the "PUMP 3 FAILURE" indicator is off	AEV	2/12/09	
640	Verify the "PUMP 3 LOW/OFF" indicator is off	AEV	2/12/09	
641	Verify the "PUMP 3 HIGH/START" indicator is on	AEV	2/12/09	
642	Verify the "PUMP 3 RUN" indicator is off	AEV	2/12/09	
643	Verify the Crest Pad Building "ALARM" indicator is off	AEV	2/12/09	
644				

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location: Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
Flood Switches, and Controls Date: 2/11/09

Line No.	Activity	Documented By	Completed Date
645	On the Roof of the Crest Pad Building:		
646	Verify the roof light outside of the crest pad building is off	AEV	2/12/09
647			
648	On the Leachate System Control Computer in [MO-481]:		
649	Acknowledge PUMP 3 fail alarm	AEV	2/12/09
650			
651	DEMONSTRATE PUMP "HAND" OPERATION:		
652	Verify PUMP 1 "HAND" Operation:		
653	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"		
654	is just above the D-4 (2.0') level.	N/A	N/A
655			
656	On the "TRENCH PUMP CONTROL PANEL":		
657	Final "PRIMARY SUMP LEVEL" reading (Feet) 2.16	AEV	2/12/09
658			
659	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"		
660	is just above the DS-2 (2.0 1.3') level.	MA	N/A
661			
662	On the "TRENCH PUMP CONTROL PANEL":		
663	Final "SECONDARY SUMP LEVEL" reading (Feet) 1.36	AEV	2/12/09
664			
665	At the Crest Pad Building Motor Control Center (MCC):		
666	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND AUTO" position	AEV	2/12/09
667			
668	On the "TRENCH PUMP CONTROL PANEL":		
669	Verify at least 10 minutes have elapsed since Pump 1 was shut down 11:52	AEV	2/12/09
670	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "HAND" position	AEV	2/12/09
671	Verify that "PUMP 1" starts	AEV	2/12/09
672	Verify the "PUMP 1 FAILURE" indicator light is off	AEV	2/12/09
673	Verify the "PUMP 1 LOW/OFF" indicator light is off	AEV	2/12/09
674	Verify the "PUMP 1 HIGH/START" indicator light is on	AEV	2/12/09
675	Verify the "PUMP 1 RUN" indicator light is on	AEV	2/12/09
676	Pump 1 "FLOW RATE (GAL/MIN)" reading 174.0	AEV	2/12/09
677	Verify PUMP 1 produces minimum 140 gpm Yes No	AEV	2/12/09
678			
679	On the "FLOW TRANSMITTER PANEL":		
680	Pump 1 "FLOW RATE (GAL/MIN)" reading 174.6	AEV	2/12/09
681			
682	On the Leachate System Control Computer in [MO-481]:		
683	Verify there is not a PUMP 1 fail alarm	AEV	2/12/09
684	Verify PUMP 1 is running (motor is green)	AEV	2/12/09
685	Pump 1 "FLOW RATE (GAL/MIN)" reading 174.0	AEV	2/12/09
686			
687	Measure Pump No. 1 Phase Current A: 8.0 B: 8.7 C: 8.2	AEV	2/12/09
688			

Project: <u>ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form</u>		Location: <u>Cell 7/Cell 8</u>	
System Tested: <u>Leachate Pumps, Transducers Flood Switches, and Controls</u>		Rev. <u>1</u>	
Purpose: <u>Demonstrate that the Leachate System operates as specified</u>		Date: <u>2/11/09</u>	
Line No.	Activity	Documented By	Completed Date
689	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
690	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	<i>JEV</i>	2/12/09
691	Verify that "PUMP 1" stops	<i>JEV</i>	2/12/09
692			
693	<u>On the Leachate System Control Computer in [MO-481]:</u>		
694	Verify PUMP 1 is not running (motor is red)	<i>JEV</i>	2/12/09
695			
696	Verify PUMP 2 "HAND" Operation:		
697	<u>At the Crest Pad Building Motor Control Center (MCC):</u>		
698	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND AUTO" position	<i>JEV</i>	2/12/09
699			
700	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
701	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "HAND" position	<i>JEV</i>	2/12/09
702	Verify that "PUMP 2" starts	<i>JEV</i>	2/12/09
703	Verify the "PUMP 2 FAILURE" indicator light is off	<i>JEV</i>	2/12/09
704	Verify the "PUMP 2 LOW/OFF" indicator light is off	<i>JEV</i>	2/12/09
705	Verify the "PUMP 2 HIGH/START" indicator light is on	<i>JEV</i>	2/12/09
706	Verify the "PUMP 2 RUN" indicator light is on	<i>JEV</i>	2/12/09
707	PUMP 2 "FLOW RATE (GAL/MIN)" reading	<i>JEV</i>	2/12/09
708	Verify PUMP 2 produces minimum 15 gpm	<i>JEV</i>	2/12/09
709			
710	<u>On the "FLOW TRANSMITTER PANEL":</u>		
711	PUMP 2 "FLOW RATE (GAL/MIN)" reading	<i>JEV</i>	2/12/09
712			
713	<u>On the Leachate System Control Computer in [MO-481]:</u>		
714	Verify there is not a PUMP 2 fail alarm	<i>JEV</i>	2/12/09
715	Verify PUMP 2 is running (motor is green)	<i>JEV</i>	2/12/09
716	PUMP 2 "FLOW RATE (GAL/MIN)" reading	<i>JEV</i>	2/12/09
717			
718	Measure Pump No. 2 Phase Current	A: <i>1.5</i> B: <i>1.8</i> C: <i>1.4</i>	<i>JEV</i> 2/12/09
719			
720	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
721	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	<i>JEV</i>	2/12/09
722	Verify that "PUMP 2" stops	<i>JEV</i>	2/12/09
723			
724	<u>On the Leachate System Control Computer in [MO-481]:</u>		
725	Verify PUMP 2 is not running (motor is red)	<i>JEV</i>	2/12/09
726			
727	Verify PUMP 3 "HAND" Operation:		
728	<u>At the Crest Pad Building Motor Control Center (MCC):</u>		
729	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND AUTO" position	<i>JEV</i>	2/12/09
730			

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location	Cell 7/Cell 8
System Tested: Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	Rev. 1
		Date	2/11/09
Line No.	Activity	Documented By	Completed Date
731	On the "TRENCH PUMP CONTROL PANEL":		
732	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "HAND" position	AEV	2/12/09
733	Verify that "PUMP 3" starts	AEV	2/12/09
734	Verify the "PUMP 3 FAILURE" indicator light is off	AEV	2/12/09
735	Verify the "PUMP 3 LOW/OFF" indicator light is off	AEV	2/12/09
736	Verify the "PUMP 3 HIGH/START" indicator light is on	AEV	2/12/09
737	Verify the "PUMP 3 RUN" indicator light is on	AEV	2/12/09
738	PUMP 3 "FLOW RATE (GAL/MIN)" reading	30.9	
739	Verify PUMP 3 produces minimum 15 gpm	(Yes) No	2/12/09
740			
741	On the "FLOW TRANSMITTER PANEL":		
742	PUMP 3 "FLOW RATE (GAL/MIN)" reading	30.8	2/12/09
743			
744	On the Leachate System Control Computer in [MO-481]:		
745	Verify there is not a PUMP 3 fail alarm	AEV	2/12/09
746	Verify PUMP 3 is running (motor is green)	AEV	2/12/09
747	PUMP 3 "FLOW RATE (GAL/MIN)" reading	30.90	2/12/09
748			
749	Measure Pump No. 3 Phase Current	A: 1.5 B: 1.9 C: 1.5	2/12/09
750			
751	On the "TRENCH PUMP CONTROL PANEL":		
752	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	AEV	2/12/09
753	Verify that "PUMP 3" stops	AEV	2/12/09
754			
755	On the Leachate System Control Computer in [MO-481]:		
756	Verify PUMP 3 is not running (motor is red)	AEV	2/12/09
757			
758	DEMONSTRATE PUMP "AUTO" OPERATION:		
759	If needed, add water to the primary sump until the "PRIMARY SUMP LEVEL"		
760	is just above the D-4 (2.0') level.	N/A	N/A
761			
762	On the "TRENCH PUMP CONTROL PANEL":		
763	Final "PRIMARY SUMP LEVEL" reading (Feet)	2.07	2/12/09
764			
765	If needed, add water to the secondary sump until the "SECONDARY SUMP LEVEL"		
766	is just above the DS-2 (2-0 1.3') level.	N/A	N/A
767			
768	On the "TRENCH PUMP CONTROL PANEL":		
769	Final "SECONDARY SUMP LEVEL" reading (Feet)	1.33	2/12/09
770			
771	Verify PUMP 1 "AUTO" Operation:		
772	On the "TRENCH PUMP CONTROL PANEL":		
773	Verify at least 10 minutes have elapsed since Pump 1 was shut down	12.08	2/12/09
774	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "AUTO" position	AEV	2/12/09

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location	Cell 7	Cell 8
System Tested: Leachate Pumps, Transducers Flood Switches, and Controls		Purpose: Demonstrate that the Leachate System operates as specified	Rev.	1
		Date	2/11/09	
Line No.	Activity	Documented By	Completed Date	
775	Verify that "PUMP 1" starts	AEV	2/12/09	
776	Verify the "PUMP 1 FAILURE" indicator light is off	AEV	2/14/09	
777	Verify the "PUMP 1 LOW/OFF" indicator light is off	AEV	2/12/09	
778	Verify the "PUMP 1 HIGH/START" indicator light is on	AEV	2/12/09	
779	Verify the "PUMP 1 RUN" indicator light is on	AEV	2/12/09	
780	Pump 1 "FLOW RATE (GAL/MIN)" reading	AEV	176.0	
781				
782	<u>On the "FLOW TRANSMITTER PANEL":</u>			
783	Pump 1 "FLOW RATE (GAL/MIN)" reading	AEV	176.7	
784				
785	<u>On the Leachate System Control Computer in [MO-481]:</u>			
786	Verify there is not a PUMP 1 fail alarm	AEV	2/12/09	
787	Verify PUMP 1 is running (motor is green)	AEV	2/12/09	
788	Pump 1 "FLOW RATE (GAL/MIN)" reading	AEV	173.9	
789				
790	Verify PUMP 2 "AUTO" Operation:			
791	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
792	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "AUTO" position	AEV	2/12/09	
793	Verify that "PUMP 2" starts	AEV	2/12/09	
794	Verify the "PUMP 2 FAILURE" indicator light is off	AEV	2/12/09	
795	Verify the "PUMP 2 LOW/OFF" indicator light is off	AEV	2/12/09	
796	Verify the "PUMP 2 HIGH/START" indicator light is on	AEV	2/12/09	
797	Verify the "PUMP 2 RUN" indicator light is on	AEV	2/12/09	
798	PUMP 2 "FLOW RATE (GAL/MIN)" reading	AEV	29.9	
799				
800	<u>On the "FLOW TRANSMITTER PANEL":</u>			
801	PUMP 2 "FLOW RATE (GAL/MIN)" reading	AEV	29.9	
802				
803	<u>On the Leachate System Control Computer in [MO-481]:</u>			
804	Verify there is not a PUMP 2 fail alarm	AEV	2/12/09	
805	Verify PUMP 2 is running (motor is green)	AEV	2/12/09	
806	PUMP 2 "FLOW RATE (GAL/MIN)" reading	AEV	30.1	
807				
808	Verify PUMP 1 "AUTO" Shutdown:			
809	Continue operation of PUMP 1 until PUMP 1 shuts off (at Level D3 - 1.2')			
810	Verify that PUMP 1 shuts off	AEV	1.20 - 1.21	
811				
812	<u>On the "TRENCH PUMP CONTROL PANEL":</u>			
813	Verify the "PUMP 1 FAILURE" indicator light is off	AEV	2/12/09	
814	Verify the "PUMP 1 LOW/OFF" indicator light is on	AEV	2/12/09	
815	Verify the "PUMP 1 HIGH/START" indicator light is off	AEV	2/14/09	
816	Verify the "PUMP 1 RUN" indicator light is off	AEV	2/12/09	
817	"PRIMARY SUMP LEVEL" reading when PUMP 1 shuts off (Feet)	AEV	1207.21	
818				

Project: ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form Location Cell 7/Cell 8
 System Tested: Leachate Pumps, Transducers Purpose: Demonstrate that the Leachate System operates as specified Rev. 1
Flood Switches, and Controls Date 2/11/09

Line No.	Activity	Documented By	Completed Date
819	<u>On the "FLOW TRANSMITTER PANEL":</u>		
820	PUMP 1 flow meter totalizer reading (gal) <u>6585.7</u> Total pumped (gal): <u>6585.7</u>	<u>JSV</u>	<u>2/12/09</u>
821	Reset PUMP 1 totalizer	<u>JSV</u>	<u>2/12/09</u>
822			
823	<u>On the Leachate System Control Computer in [MO-481]:</u>		
824	Verify PUMP 1 is not running (motor is red)	<u>JSV</u>	<u>2/12/09</u>
825	PUMP 1 flow meter totalizer reading (gal) Total pumped (gal):	see Exception CELL7-02	
826	Reset PUMP 1 totalizer	see Exception CELL7-02	
827			
828	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
829	Switch the "PUMP 1 HAND-OFF-AUTO" switch to the "OFF" position	<u>JSV</u>	<u>2/12/09</u>
830			
831	Verify PUMP 2 "AUTO" Shutdown:		
832	Continue operation of PUMP 2 until PUMP 2 shuts off (at Level D1 - 0.8')		
833	Verify that PUMP 2 shuts off	<u>JSV</u>	<u>2/12/09</u>
834			
835	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
836	Verify the "PUMP 2 FAILURE" indicator light is off	<u>JSV</u>	<u>2/12/09</u>
837	Verify the "PUMP 2 LOW/OFF" indicator light is on	<u>JSV</u>	<u>2/12/09</u>
838	Verify the "PUMP 2 HIGH/START" indicator light is off	<u>JSV</u>	<u>2/12/09</u>
839	Verify the "PUMP 2 RUN" indicator light is off	<u>JSV</u>	<u>2/12/09</u>
840	"PRIMARY SUMP LEVEL" reading when PUMP 2 shuts off <u>0.80</u>	<u>JSV</u>	<u>2/12/09</u>
841			
842	<u>On the "FLOW TRANSMITTER PANEL":</u>		
843	PUMP 2 flow meter totalizer reading (gal) <u>4144</u> Total pumped (gal): <u>4144</u>	<u>JSV</u>	<u>2/12/09</u>
844	Reset PUMP 2 totalizer <u>Pump 2 2338.4 Pump 1 1805.4</u>	<u>JSV</u>	<u>2/12/09</u>
845		<u>JSV</u>	<u>2/12/09</u>
846	<u>On the Leachate System Control Computer in [MO-481]:</u>		
847	Verify PUMP 2 is not running (motor is red)	<u>JSV</u>	<u>2/12/09</u>
848	PUMP 2 flow meter totalizer reading (gal) Total pumped (gal):	see Exception CELL7-02	
849	Reset PUMP 2 totalizer <u>2/22/09</u>	see Exception CELL7-02	
850	<u>Reset Pump 1 totalizer</u> <u>WAB 2/23/09 JSV 2/23/09</u>	<u>JSV</u>	<u>2/12/09</u>
851	<u>On the "TRENCH PUMP CONTROL PANEL":</u> <u>RA 2/23/09</u>		
852	Switch the "PUMP 2 HAND-OFF-AUTO" switch to the "OFF" position	<u>JSV</u>	<u>2/12/09</u>
853			
854	Verify PUMP 3 "AUTO" Operation:		
855	<u>On the "TRENCH PUMP CONTROL PANEL":</u>		
856	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "AUTO" position	<u>JSV</u>	<u>2/12/09</u>
857	Verify that "PUMP 3" starts	<u>JSV</u>	<u>2/12/09</u>
858	Verify the "PUMP 3 FAILURE" indicator light is off	<u>JSV</u>	<u>2/12/09</u>
859	Verify the "PUMP 3 LOW/OFF" indicator light is off	<u>JSV</u>	<u>2/12/09</u>
860	Verify the "PUMP 3 HIGH/START" indicator light is on	<u>JSV</u>	<u>2/12/09</u>
861	Verify the "PUMP 3 RUN" indicator light is on	<u>JSV</u>	<u>2/12/09</u>
862	PUMP 3 "FLOW RATE (GAL/MIN)" reading <u>30.5</u>	<u>JSV</u>	<u>2/12/09</u>

Project:		ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form		Location	Cell 7/Cell 8
System Tested:		Leachate Pumps, Transducers Flood Switches, and Controls	Purpose:	Demonstrate that the Leachate System operates as specified	Rev. Date
Line No.	Activity	Documented By	Completed Date		
863					
864	<u>On the "FLOW TRANSMITTER PANEL":</u>				
865	PUMP 3 "FLOW RATE (GAL/MIN)" reading		30.5	JEU	2/12/09
866					
867	<u>On the Leachate System Control Computer in [MO-481]:</u>				
868	Verify there is not a PUMP 3 fail alarm	JEU			2/12/09
869	Verify PUMP 3 is running (motor is green)	JEU			2/12/09
870	PUMP 3 "FLOW RATE (GAL/MIN)" reading	JEU	30.8		2/12/09
871					
872	Verify PUMP 3 "AUTO" Shutdown:				
873	Continue operation of PUMP 3 until PUMP 3 shuts off at Level DS-1 (4-2 0.8')				
874	Verify that PUMP 3 shuts off	JEU			2/12/09
875					
876	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
877	Verify the "PUMP 3 FAILURE" indicator light is off	JEU			2/12/09
878	Verify the "PUMP 3 LOW/OFF" indicator light is on	JEU			2/12/09
879	Verify the "PUMP 3 HIGH/START" indicator light is off	JEU			2/12/09
880	Verify the "PUMP 3 RUN" indicator light is off	JEU			2/12/09
881	"SECONDARY SUMP LEVEL" reading when PUMP 3 shuts off (Feet)	JEU	0.81		2/12/09
882					
883	<u>On the "FLOW TRANSMITTER PANEL":</u>				
884	PUMP 3 flow meter totalizer reading (gal)		1707.8	Total pumped (gal):	1707.9
885	Reset PUMP 3 totalizer	JEU			2/12/09
886					
887	<u>On the Leachate System Control Computer in [MO-481]:</u>				
888	Verify PUMP 3 is not running (motor is red)	JEU			2/12/09
889	PUMP 3 flow meter totalizer reading (gal)			Total pumped (gal):	see Exception CELL7-02
890	Reset PUMP 3 totalizer				see Exception CELL7-02
891					
892	<u>On the "TRENCH PUMP CONTROL PANEL":</u>				
893	Switch the "PUMP 3 HAND-OFF-AUTO" switch to the "OFF" position	JEU			2/12/09
894					

Project:	ERDF CELLS 7&8 ACCEPTANCE TEST PROCEDURE (ATP) - Test Execution Form	Location	Cell 7/Cell 8
System Tested:	Leachate Pumps, Transducers Flood Switches, and Controls	Purpose:	Demonstrate that the Leachate System operates as specified
		Rev.	1
		Date	2/11/09
Line No.	Activity	Documented By	Completed Date

Exceptions:

Number of Exceptions (Attached): 3

Summary of Exceptions, Actions Taken, and Results:

CELL7-01: Did not simulate "HIGH HIGH TANK" alarm from the Leachate System Control Computer in MO-481.

CELL7-02: The Leachate System Control Computer in MO-481 does not have a flow totalizer.

CELL8-01: MISSED Subcontractor provided test equipment Flow meter reading (332)

Witnesses:

<u>W.A. Borlaug</u> WCH Construction Project Manager (Print & Signature)	<u>WCH</u> Company	<u>2/12/09</u> Date
<u>R.M. Kelso</u> WCH STR (Print & Signature)	<u>WCH</u> Company	<u>2/12/09</u> Date
<u>Ryan Harris</u> TEST DIRECTOR (Print & Signature)	<u>TEM</u> Company	<u>2-12-09</u> Date
<u>David Sterley</u> SUBCONTRACTOR QC (Print & Signature)	<u>Delhur, Inc.</u> Company	<u>2/12/09</u> Date
<u>Joseph E Voss</u> COA SUBCONTRACTOR/Recorder (Print & Signature)	<u>ENVIRATECH</u> Company	<u>2/12/09</u> Date
<u>Nick Clapper</u> Witness (Print & Signature)	<u>DelHur, Inc.</u> Company	<u>2-12-09</u> Date
<u>Adrian Gowen</u> Witness (Print & Signature)	<u>WCH</u> Company	<u>2-12-09</u> Date
<u>Rodney R Thorne</u> Witness (Print & Signature)	<u>WCH</u> Company	<u>2-12-09</u> Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date
Witness (Print & Signature)	Company	Date

ATP Reviewed By:

<u>Owen Robertson</u> DOE-RL (Print & Signature)	<u>DOE</u> Company	<u>2/12/09</u> Date
<u>David Einar</u> EPA (Print & Signature)	<u>EPA</u> Company	<u>12 Feb 09</u> Date

* THE ORIGINAL EXCEPTION No. CELL 7-01 signed and dated 2/12/09
 was misplaced and this REPLACEMENT FORM WAS RESIGNED AND ADDED
 TO ACCEPTANCE TEST EXECUTION FORM. WAB
 2/23/09

EXCEPTION FORM

EXCEPTION NUMBER. CELL 7-01 SHEET 1 OF 1
 DATE 2/11/09

EXCEPTIONS BY: W.A. BORLAUG
 NAME
WCH
 ORGANIZATION

DESCRIPTION: LINE Nos. 509, 513, and 528 were not performed.
SIMULATING THE "HIGH HIGH TANK" ALARM AT THE LEACHATE
SYSTEM CONTROL COMPUTER IN [MO-421] WILL SHUT DOWN THE
PUMPS IN ACTIVE CELLS 1 THROUGH 6.

ACTION TAKEN: SIMULATED "HIGH HIGH TANK" ALARM ONLY TO
CELL 7 OR CELL 8. TO DEMONSTRATE PUMPS WILL SHUT OFF
WHEN THERE IS A "HIGH HIGH TANK" ALARM.

APPROVED:

<u>W.A. Borlaug for T. KISENWEHER</u>	<u>2/11/09</u>
WCH Construction Manager	Date
<u>Ryan Harris</u> Total Energy Management	<u>2/23/09</u>
Test Director	Date
<u>Robyn M. Kelso</u>	<u>2/24/09</u>
Witness Name / Organization	Date
<u>Rodney Thamm</u> WCH-QA	<u>2/24/09</u>
Witness Name / Organization	Date
<u>David M. [Signature]</u> Delhur Industries	<u>2/23/09</u>
Construction Subcontractor / Organization	Date
<u>[Signature]</u> WCH-	<u>2/24/09</u>
Other / Organization	Date
<u>[Signature]</u>	<u>2/23/09</u>
Recorder / Organization	Date

EXCEPTION FORM

EXCEPTION NUMBER. CELL7-02

SHEET 1 OF 1

DATE 2/11/09

EXCEPTIONS BY:

W.A. Borlaug

NAME

WCH

ORGANIZATION

DESCRIPTION: LINE NOS. 825, 826, 848, 849, 889, AND 890
CAN NOT BE COMPLETED BECAUSE THE LEACHATE SYSTEM
CONTROL COMPUTER IN MO-481 DOES NOT DISPLAY FLOW TOTALS.
FLOW TOTALS ARE DISPLAYED ONLY IN THE CREST PAD BUILDINGS.

ACTION TAKEN: NONE REQUIRED.

APPROVED:

W.A. Borlaug for T. KISENWEITER

WCH Construction Manager

2/11/09

Date

Ryan Harris

Test Director

2-12-09

Date

R.M. Kelso For B. JACK HOWARD / WCH

Witness Name / Organization

2/12/09

Date

[Signature] WCH

2/12/09

Date

Witness Name / Organization

[Signature] Delhav, Inc.

Construction Subcontractor / Organization

2/12/09

Date

Other / Organization

[Signature] / ENVIROTECH - CQA

Recorder / Organization

Date

2/12/09

Date

EXCEPTION FORM

EXCEPTION NUMBER. CEU9-01

SHEET 1 OF 1

DATE 2/12/09

EXCEPTIONS BY:

W.A. Borleng
NAME

WCH
ORGANIZATION

DESCRIPTION: THE FINAL FLOW METER READING WAS NOT RECORDED ON LINE No. 332.

ACTION TAKEN: WHEN THE WATER LEVEL IN THE SUMP REACHED 1.38' (LINE 367) THE ADDITION OF WATER WAS STOPPED AND THE FLOW METER READING RECORDED AT 10,745 GALLONS WITH TOTAL ADDED (GALLONS) = 1,072 (LINE 370). THE WATER ~~IN~~ IN THE SUMP WAS PUMPED DOWN FROM 1.38' TO ^{1.29' BS 2/12/09} 1.30', REMOVED 126 GALLONS. THE TOTAL ADDED (GALLONS) FOR LINE 332 WAS DETERMINED BY SUBTRACTING 126 GALLONS FROM THE TOTAL ADDED (GALLONS) ON LINE 370: 1,072 - 126 GALLONS = 946 GALLONS (LINE 332)

APPROVED:

W.A. Borleng
WCH Construction Manager

2/12/09
Date

Ryan Harris
Test Director

2-12-09
Date

Witness Name / Organization
ADRIAN GOUGH

Date
2/12/09

Witness Name / Organization
SALEVA / ENVIROTECH - CQA

Date
2/12/09

Construction Subcontractor / Organization
RECORDER / Organization
FW 2/12/09

Date

Other / Organization
Delhur Inc.

Date
2/12/09

Recorder / Organization
CONSTRUCTION SUBCONTRACTOR / Organization
2/14/09

Date

CONSTRUCTION EQUIPMENT

CONTENTS

1.0	GENERAL.....	3
	1.1 SUMMARY.....	3
	1.2 ABBREVIATIONS.....	3
	1.3 CODES, STANDARDS, LAWS, AND REGULATIONS.....	3
	1.4 DEFINITIONS.....	4
	1.5 TECHNICAL SUBMITTALS.....	4
	1.5.1 Equipment List.....	4
	1.5.2 Equipment Inspection and Preventive Maintenance Program.....	4
	1.5.3 Equipment Maintenance Pad.....	5
	1.5.4 Material Safety Data Sheets.....	5
2.0	MATERIALS AND EQUIPMENT.....	5
	2.1 CONSTRUCTION EQUIPMENT.....	5
	2.2 FUELING STORAGE AND DELIVERY SYSTEMS.....	6
	2.3 EQUIPMENT MAINTENANCE.....	6
	2.3.1 General.....	6
	2.3.2 Inspections and Maintenance.....	6
	2.3.3 Equipment Safety.....	7
	2.3.4 Equipment Operators.....	8
	2.3.5 Flagmen and Spotters.....	8
	2.3.6 Environmental Considerations.....	9
3.0	EXECUTION.....	9
	3.1 INTEGRATED WORK CONTROL.....	9

CONSTRUCTION EQUIPMENT

1.0 GENERAL

1.1 SUMMARY

This specification establishes the general requirements for operating and maintaining construction and transportation equipment for the construction of ERDF Cells 9 & 10.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CFR	U.S. Code of Federal Regulations
DOT	Department of Transportation
OSHA	Occupational Safety and Health Administration
RCW	Revised Code of Washington
SSRS	Subcontractor/Supplier Submittal Requirement Summary
WAC	Washington Administrative Code

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for operating and maintaining construction and transportation equipment. Failure of the SUBCONTRACTOR to identify any other applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 61	National Emissions Standards for Hazardous Air Pollutants
40 CFR 112	Oil Pollution Prevention
40 CFR 300	National Oil and Hazardous Substances Contingency Plan
49 CFR 393	Parts and Accessories Necessary for Safe Operation
ANSI/ASME	Applicable B30 Standards

RCW 46.37	Vehicle Lighting and Other Equipment
RCW 46.44	Size, Weight, Load
WAC 173 400	General Regulations for Air Pollution Sources

1.4 DEFINITIONS

Not used.

1.5 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.5.1 Equipment List

Before delivery, the SUBCONTRACTOR shall submit to the CONTRACTOR a listing of equipment that will be used during construction activities, a description of how such equipment will be used, and a description of any constraints or limitations associated with the equipment. The SUBCONTRACTOR shall update the equipment listing when additional equipment is brought on to or removed from the site. Prior to mobilization, the SUBCONTRACTOR shall submit certification that equipment delivered to the site is Occupational Safety and Health Administration (OSHA) compliant, uncontaminated, and has been inspected and meets the requirements of the Subcontract Documents.

The submittal shall include manufacturer's descriptive data, safety data, catalog cuts, literature and other data as necessary to fully describe that the proposed equipment comply with specified requirements.

1.5.2 Equipment Inspection and Preventive Maintenance Program

The SUBCONTRACTOR shall submit for approval an equipment inspection and preventive maintenance program. A checklist shall be developed for each piece of equipment that includes, at a minimum, items required by the manufacturer's recommendations, 29 CFR 1926.601 for motor vehicles and 29 CFR 1926.602 for material handling equipment. The checklist shall include or reference criteria for performing daily inspections. The checklist shall also include or reference criteria for determining the acceptability of equipment for use. Checklists are to ensure that safety-related devices (e.g., brakes, warning indicators, gages) are tested and functioning properly. The SUBCONTRACTOR's program shall include any hoisting and rigging techniques, methods, and equipment required for maintenance and repairs of the construction and transportation equipment.

The submittal shall include a description of the process for revising the checklists to ensure accuracy and adequacy prior to use.

1.5.3 Equipment Maintenance Pad

The SUBCONTRACTOR shall submit a proposed location for regular maintenance of the construction and transportation equipment. The location is subject to CONTRACTOR's approval. The submittal shall include any proposed grading, drainage and access, proposed fueling facilities and any other construction elements intended for equipment maintenance.

1.5.4 Material Safety Data Sheets

The SUBCONTRACTOR shall provide Material Safety Data Sheets for all fluids and other substances necessary for operating and maintaining construction and transportation equipment, in accordance with Exhibits "G" and "J".

2.0 MATERIALS AND EQUIPMENT

2.1 CONSTRUCTION EQUIPMENT

The CONTRACTOR shall supply technical data on ground pressure for all equipment proposed to be used above geosynthetics.

The SUBCONTRACTOR is responsible for selecting, procuring, delivering, operating and maintaining all construction equipment for the scope of work under this Contract. All equipment shall comply with the requirements listed in this Specification and any other requirements listed in other documents for this Contract. Equipment used on the project shall comply with Occupational Safety and Health Administration (OSHA) regulations 29 CFR 1910 and 29 CFR 1926 and the American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) B30 series of standards, as applicable.

The following restrictions shall apply:

1. The use of articulated dump trucks is prohibited;
2. The use of chains for any maintenance, equipment removal or any other purpose is prohibited.

The SUBCONTRACTOR shall properly plan the equipment usage against the work schedule to identify and submit the actual number of trucks, dozers, excavators, compactors and any other construction equipment and allow for proper mobilization to assure that demand for the equipment is not over or understated.

The SUBCONTRACTOR shall provide sufficient water trucks to provide dust control on all construction and access road (including the Construction Access Road from Route 3 to the east gate of the ERDF fence) and for compaction activities.

Prior to on-site equipment mobilization, the SUBCONTRACTOR must provide necessary testing to ensure that the equipment will operate satisfactorily and safely in accordance with CONTRACTOR requirements and specifications. It shall include at a minimum the required hydrostatic, pneumatic, electrical, ventilation, and mechanical functioning.

The SUBCONTRACTOR shall have sufficient spare parts available on site, or the capability to deliver to the site in such a manner that the construction schedule is not compromised.

2.2 FUELING STORAGE AND DELIVERY SYSTEMS

The SUBCONTRACTOR may elect to install a fueling tank in the construction maintenance area or have regular or overnight delivery of gasoline, diesel fuel and oil, in sufficient quantities such as the production and schedule are not compromised.

Any proposed fuel storage tanks for onsite distribution of diesel fuel and gasoline shall be located above ground and provided with secondary containment features.. If fuel or other fluids are spilled SUBCONTRACTOR shall manage the spills in accordance with the requirements specified in Exhibit "J".

2.3 EQUIPMENT MAINTENANCE

2.3.1 General

Daily and regular service and maintenance of the equipment shall be performed in the construction maintenance area, or, with prior CONTRACTOR's approval at the location where the respective equipment operates. For major repairs requiring long time duration, the SUBCONTRACTOR shall remove the equipment from the site and promptly replace it with a similar piece of equipment.

SUBCONTRACTOR shall provide vehicle fuel and regular preventive maintenance services for the duration of the subcontract performance period. SUBCONTRACTOR shall perform timely repairs to all equipment found to be in need of repair, prior to operation.

2.3.2 Inspections and Maintenance

Equipment brought to the site shall be maintained and operated as intended by the manufacturer; shall be in good working condition; and shall be free of residual dirt, oil, or grease. Cracked or broken glass shall be promptly replaced. No modifications or additions that affect the capacity or safe operation of the equipment shall be made without the manufacturer's and CONTRACTOR's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. All construction

and transportation equipment shall be inspected (including functional checks) at the beginning of each shift to ensure that the equipment is in safe operating condition and free of damage or wear and tear that could cause failure while in use. The inspections shall be documented prior to using the equipment.

The SUBCONTRACTOR shall maintain an orderly file of equipment maintenance, inspection, and repair records available for CONTRACTOR review for the duration of the Subcontract.

The SUBCONTRACTOR shall use only manufacturer- recommended vehicle fluids.

2.3.3 Equipment Safety

The SUBCONTRACTOR shall correct equipment safety deficiencies immediately throughout the duration of the project. The CONTRACTOR reserves the right to inspect and test the equipment and its setup for safe operation at any time. All construction and transportation equipment shall meet safe operating requirements as prescribed by OSHA.

Vehicles operated on public highways shall comply with all legal requirements. The vehicles shall conform to all applicable federal and Washington State laws, including the following requirements, at a minimum: 46 RCW, 49 CFR (172 Appendix C, 393, 566, 567, 571). The vehicles shall also conform to all applicable Department of Transportation (DOT) regulations. Vehicles shall include the following minimum safety equipment: fire extinguisher, reflector kit, first aid kit, and backup alarm.

In the event that operators, mechanics, or other personnel need to perform work or have access to a height of 6 feet or more on heavy equipment, cranes, or other vehicles, they will need to have a method of primary fall protection as required by Exhibit "G" and OSHA standards on fall protection, 1926.501 (a), (b) and 1926.502 (a), (b). Fall protection may include, but not be limited to: handrails, grab rails, fall arrest systems, aerial lifts, scaffolding, etc.

Front windshields on equipment cabs shall remain closed during excavation and load out operations. All cab glass shall be safety glass, or equivalent, that introduces no visible distortions affecting the safe operation of the equipment or visibility of the operator. Cracked or broken glass on heavy equipment and windows that obscure vision because of scratches, weathering, or scarring shall be immediately replaced. Daily operator inspections shall ensure that no visible distortions or cracked and broken glass is present affecting safe operation. Equipment cabs shall have a climate controlled ventilation system that will allow the cab door and windows to remain closed during operation while providing protection for the operator from weather conditions and dust.

All heavy equipment shall have suitable cab protection from shifting or falling debris or from roll over, consistent with the equipment's intended use and associated hazards.

No modifications or additions, which affect the capacity or safe operation of the equipment shall be made without the manufacturer's and CONTRACTOR's written approval. If such

modifications are made the capacity, operation, and maintenance instruction plates, tags or decals shall be changed accordingly. All equipment including attachment usage shall be operated within the manufacturer's safety requirements and rated capacities and capabilities.

No vehicle or equipment (other than an excavator) shall operate within 2 feet of a properly sloped (1.5H: 1 .0V) excavation. The SUBCONTRACTOR shall document the criteria for each activity requiring an OSHA competent person and shall identify its OSHA competent person(s) in writing to the CONTRACTOR. The excavation shall be inspected by the SUBCONTRACTOR'S OSHA competent person in accordance with OSHA 29 CFR 1926 prior to beginning work each shift or as conditions change. The inspection shall be for signs (or lack thereof) of instability or potential instability to include observations of the following:

- Slumping, depressions, or tension cracks at the top of slope
- Visible/active sloughing or raveling of side slopes
- Presence of free water on the top of the slope or slope surface.

At a minimum, inspections shall be documented in the SUBCONTRACTOR'S daily report or log book, and shall include review of administrative and engineering controls, as appropriate. If there are observed signs of slope instability, the OSHA competent person shall take immediate corrective action to ensure worker health and safety for necessary activities near the top of the excavation slope and at the excavation entry. No personnel or equipment shall enter the excavation until required corrective measures are completed and documented.

2.3.4 Equipment Operators

Truck drivers/operators must be properly licensed in accordance with applicable State and Federal regulations. All drivers and equipment operators must be properly trained and familiar with the equipment manufacturers' safe operating procedures. Equipment shall be operated by qualified personnel in a manner to safeguard adjacent workers from injury.

Daily documented equipment inspection records must be maintained and available for review upon request

2.3.5 Flagmen and Spotters

Flagmen/spotters shall be provided as needed to assist construction and transportation equipment operators in the safe operation of equipment. Personnel assigned as flagmen/spotters shall be properly trained and familiar with proper hand signaling techniques and safe equipment operating instructions.

2.3.6 Environmental Considerations

The SUBCONTRACTOR shall furnish and maintain dedicated spill kits at the equipment maintenance area while in use, at fueling stations, at oil lubricant stations, at maintenance work areas, and at each heavy equipment location. The spill kits shall contain appropriate material (scoops, shovels, and absorbent materials) for absorbing a liquid spill of at least 55 gallons. The kit shall be marked "SPILL KIT" and containerized to protect the kit contents from the elements (i.e., rain, snow, wind, etc.). Kit contents shall be completely replaced within 24 hours after use.

The SUBCONTRACTOR shall dispose of equipment maintenance wastes in accordance with applicable state and federal regulations and Exhibit "J."

The SUBCONTRACTOR shall manage vehicle waste including disposal and recycling as appropriate.

3.0 EXECUTION

3.1 INTEGRATED WORK CONTROL

1. Equipment maintenance work shall be conducted in accordance with the Integrated Work Control Program (IWCP) requirements specified in Exhibit "K".

PIPE, VALVES, AND SPECIALS

CONTENTS

1.0	GENERAL.....	4
	1.1 SUMMARY.....	4
	1.2 ABBREVIATIONS.....	4
	1.3 REFERENCES.....	4
	1.4 CODES, STANDARDS, LAWS, AND REGULATIONS.....	5
	1.5 TECHNICAL SUBMITTALS.....	9
	1.5.1 Manufacturer's Information.....	9
	1.5.2 Installation Instructions.....	9
	1.5.3 Statement of Satisfactory Installation.....	9
	1.6 GENERAL REQUIREMENTS.....	9
	1.7 DELIVERY, STORAGE AND HANDLING.....	10
2.0	MATERIALS AND EQUIPMENT.....	10
	2.1 POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS.....	10
	2.2 PLASTIC MARKING TAPE.....	11
	2.3 HDPE PIPE.....	12
	2.3.1 Resin.....	12
	2.3.2 Quality.....	12
	2.3.3 Form.....	12
	2.3.4 Manufacturer's QC Certificates.....	13
	2.4 HDPE DOUBLE CONTAINMENT PIPE.....	13
	2.4.1 Pipe Materials.....	13
	2.4.2 Configuration.....	13
	2.4.3 Support Spacers.....	13
	2.4.4 End Seals.....	13
	2.4.5 HDPE Fittings.....	14
	2.5 HDPE COUPLINGS AND END CAPS.....	14
	2.5.1 Couplings.....	14
	2.5.2 Flanged Connections.....	14
	2.5.3 End Caps.....	14
	2.6 PERFORATIONS AND PENETRATIONS.....	14
	2.6.1 Leachate Collection Piping.....	14
	2.6.2 Sump Pipes.....	14
	2.7 HDPE FLATSTOCK.....	15
	2.7.1 Resin.....	15
	2.7.2 Material Properties.....	15
	2.7.3 Thickness.....	15
	2.8 BOOTS.....	15
	2.9 HDPE PIPE SCHEDULE.....	15
	2.10 VALVES.....	16
	2.10.1 Gate Valves.....	16
	2.10.2 Ball Check Valves.....	16
	2.10.3 Ball Valves.....	16

	2.10.4 Valve Schedule (Each Crest Pad Building)	16
2.11	FLOW METERS	17
	2.11.1 Paddle Meters.....	17
2.12	MANHOLES	18
2.13	FLOOD SWITCHES	18
2.14	MISCELLANEOUS ITEMS	18
	2.14.1 Valve Nameplates	18
	2.14.2 Service Clamps	18
	2.14.3 Pipe Supports	18
3.0	EXECUTION.....	19
3.1	IDENTIFICATION OF PIPING.....	19
	3.1.1 Labels.....	19
	3.1.2 Lettering.....	19
3.2	IDENTIFICATION OF VALVES AND SHORT PIPE LENGTHS	19
	3.2.1 General.....	19
	3.2.2 Tags.....	19
3.3	PIPE INSTALLATION	19
	3.3.1 Cutting of Pipe.....	19
	3.3.2 Joint Deflection.....	20
	3.3.3 Placing and Laying	20
	3.3.4 Connections.....	20
	3.3.5 Penetrations.....	20
	3.3.6 Flanged Pipe.....	20
	3.3.7 Jointing.....	21
	3.3.8 Crest Pad Valves and Drain Lines	21
	3.3.9 Pipe Supports	21
3.4	HDPE PIPE INSTALLATION.....	21
3.5	ACCEPTANCE TESTING.....	23
	3.5.1 General.....	24
	3.5.2 Buried Pipe Testing.....	25
	3.5.3 Raw Water Pipe	25
3.6	CLEANING	26
3.7	QUALITY ASSURANCE/QUALITY CONTROL	26

PIPING, VALVES, AND SPECIALS

1.0 GENERAL

1.1 SUMMARY

This specification establishes quality and workmanship requirements and defines how quality is measured for the Piping, Valves, and Specials.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

API	American Petroleum Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CFR	Code of Federal Regulations
ERDF	Environmental Restoration Disposal Facility
GSA	U.S. General Services Administration
HDPE	High Density Polyethylene
MSS	Manufacturers Standardization Society of the Valves and Fittings Industry
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PVC	Polyvinyl Chloride
psi	Pounds per Square Inch
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Program
SDR	Standard Dimension Ratio
SSRS	Subcontractor/Supplier Submittal Requirements Summary
VARV	Vacuum/Air Release Valve
VRV	Vacuum Release Valve

1.3 REFERENCES

29 CFR 1910	Occupational Safety and Health Standards
49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
49 CFR 192.285	Plastic pipe: Qualifying persons to make joints.
ANSI/ASME	Applicable B31 Standards

1.4 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Piping, Valves, and Specials. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Piping, Valves, and Specials. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

49 CFR 192.285	Plastic pipe: Qualifying persons to make joints
ASME B1.20.1	Pipe Threads, General Purpose (Inch)
ASME B16	Standards of Pipes and Fittings
ASME B16.1	Cast iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250
ASME B16.3	Malleable Iron Threaded Fittings
ASME B16.34	Valves-Flanged, Threaded, and Welding End
ASME B16.5	Pipe Flanges and Flanged Fittings
ASME B31.1	Power Piping
ASME B31.3	Process Piping
ASME B31.9	Building Services Piping
ASME B36.10M	Welded and Seamless Wrought Steel Pipe
ASME B36.19M	Stainless Steel Pipe
ASTM A53/A53M	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A193/A193M	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications

ASTM A194/A194M	Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A276	Standard Specification for Stainless Steel Bars and Shapes
ASTM A312/A312M	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Pipes
ASTM A351/A351M	Standard Specification for Castings, Austenitic, for Pressure-Containing Parts
ASTM A403/A403M	Standard Specification for Wrought Austenitic Stainless Steel Pipe Fittings
ASTM A743/A743M	Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application
ASTM A744/A744M	Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service
ASTM A813/A813M	Standard Specification for Single- or Double-Welded Austenitic Stainless Steel Pipe
ASTM A814/A814M	Standard Specification for Cold-Worked Welded Austenitic Stainless Steel Pipe
ASTM A815/A815M	Standard Specification for Wrought Ferritic, Ferritic/Austenitic, and Martensitic Stainless Steel Piping Fittings
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM D792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1248	Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
ASTM D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1784	Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds

ASTM D1785	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2000	Standard Specification for Rubber Products in Automotive Applications
ASTM D2241	Standard Specification for Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
ASTM D2464	Standard Specification for Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2466	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2467	Standard Specification for Socket-Type Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2513	Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
ASTM D2564	Standard Specification for Solvent Cements for Polyvinyl Chloride (PVC) Plastic Piping Systems
ASTM D2657	Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
ASTM D2683	Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
ASTM D2855	Standard Practice for Making Solvent-Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings
ASTM D3350	Standard Specification for Polyethylene Plastics Pipe and Fitting Materials
ASTM F593	Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F1476	Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications
ASTM F2620	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
AWWA C104/A21.4	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

AWWA C105/A21.5	Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110/A21.10	Ductile-Iron and Gray-Iron Fittings for Water
AWWA C111/A21.11	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115/A21.15	Flanged Ductile-Iron Pipe with Threaded Flanges
AWWA C151/A21.51	Ductile-Iron Pipe, Centrifugally Cast
AWWA C153/A21.53	Ductile-Iron Compact Fittings for Water Service
AWWA C207	Steel Pipe Flanges for Waterworks Service Sizes 4 In. Through 144 In. (100 mm through 3,600 mm)
AWWA C208	Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C500	Metal-Seated Gate Valves for Water Supply Services
AWWA C502	Dry-Barrel Fire Hydrants
AWWA C504	Rubber-Sealed Butterfly Valves
AWWA C509	Resilient-Seated Gate Valves for Water Supply Service
AWWA C511	Reduced-Pressure Principle Backflow-Prevention Assembly
AWWA C600	Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances
AWWA C606	Grooved and Shouldered Joints
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In Through 12 In (100 mm through 300 mm), for Water Transmission and Distribution
AWWA M23	PVC Pipe - Design and Installation
GSA FS RR-W-410	Wire Rope and Strand
MSS SP-58	Pipe Hangers and Supports – Materials, Design and Manufacture
MSS SP-69	Pipe Hangers and Supports – Selection and Application
MSS SP-80	Bronze Gate, Globe, Angle and Check Valves

NFPA 24	Standard for the Installation of Private Fire Service Mains and their Appurtenances
NFPA 49	Hazardous Chemicals Data
NFPA 325M	Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids
NFPA 704	Standard System for the Identification of the Hazards of Materials for Emergency Response

1.5 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.5.1 Manufacturer's Information

Printed copies of the manufacturer's literature stating materials of construction, applicable standards, capacities, rated pressures, and other product information indicate compliance with the project specifications.

1.5.2 Installation Instructions

The manufacturer's recommendations for each material or procedure will be utilized.

1.5.3 Statement of Satisfactory Installation

A statement signed by the SUBCONTRACTOR's principal officer stating that the installation is satisfactory and in accordance with the Subcontract plans, drawings, codes, standards, and specifications and the manufacturer's prescribed procedures and techniques, upon completion of the project and before final acceptance.

1.6 GENERAL REQUIREMENTS

This specification covers the procurement, installation, and testing of the leachate, and raw water (if used) systems. The SUBCONTRACTOR shall have a copy of the manufacturer's instructions available at the construction site and shall follow those instructions unless directed otherwise by the CONTRACTOR. Pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material before, during, and after installation. Backfilling shall be accomplished after inspection by the CONTRACTOR and others. The SUBCONTRACTOR shall replace damaged materials and redo unacceptable work at no additional cost to the CONTRACTOR.

1.7 DELIVERY, STORAGE AND HANDLING

Materials and equipment shall be handled so as to insure delivery to the site in sound, undamaged condition. Materials and equipment shall be stored with protection from weather, humidity and temperature variations, dirt and dust, or other contaminants, in accordance with code and standard requirements and manufacture's recommendations. Proper protection and care of materials before, during, and after installation shall be the SUBCONTRACTOR's responsibility. Any materials found to be damaged or unacceptable shall be repaired or replaced at SUBCONTRACTOR's expense. During storage and installation, piping and similar openings shall be capped to keep out dirt and other foreign matter.

2.0 MATERIALS AND EQUIPMENT

2.1 POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS

- a) Pipe 4-inch through 12-inch diameter shall conform to AWWA C900, Class 200, CIOD pipe dimensions, elastomeric-gasket joint, unless otherwise shown or specified.
 - 1) For pipe 4-inch diameter and larger: Fittings and specials shall be ductile iron, bell end in accordance with AWWA C110, 350 psi pressure rating unless otherwise shown or specified, except that profile of bell may have special dimensions as required by the pipe manufacturer. Fittings and specials constructed of the same material as the pipe shall be fitted with elastomeric gaskets in conformance with AWWA C900. Iron fittings and specials shall be cement-mortar lined (standard thickness) in accordance with AWWA C104. Fittings shall be bell and spigot or plain end pipe, or as applicable. Ductile iron compact fittings shall be in accordance with AWWA C153. (Specials: special ductile iron pipe fittings to meet out-of-the-ordinary construction requirements, including welded outlets, wall sleeves, thrust collar/water stops, saddle outlets, castings, bell-less ductile iron pipe for trenchless installation, and fittings with unique combinations of joints.)
- b) Pipe Less Than 4-inch Diameter:
 - 1) Pipe

Schedule 80 PVC: Type I, Grade I or Class 12454-B conforming to ASTM D1784 and ASTM D1785. Pipe shall be manufactured with 1.5 percent titanium dioxide for ultraviolet protection.
Threaded Nipples: Schedule 80 PVC.
 - 2) Fittings

Schedule to Match Pipe: ASTM D2466 and ASTM D2467 for socket-weld type and Schedule 80
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ASTM D2464 for threaded type. Fittings shall be manufactured with 1.5 percent titanium dioxide for ultraviolet protection.

- 3) Joints Solvent socket-weld except where connection to threaded valves and equipment that require disassembly.
- 4) Flanges One piece, molded hub type PVC flat face flange in accordance with Fittings above, 125-pound ANSI B16.1
- 5) Bolting ASTM A193/A193M Type 316 stainless steel Grade B8M hex head bolts and ASTM A194/ A194M Grade 8M hex head nuts.
- 6) Gaskets Flat Face Mating Flange: Full faced 1/8-inch thick ethylene propylene (EPR) rubber.

Raised Face Mating Flange: Flat ring 1/8-inch ethylene propylene (EPR) rubber, with filler gasket between OD of raised face and flange OD to protect the flange from bolting moment.
- 7) Solvent Cement and primer as recommended by the pipe and fitting manufacturer conforming to ASTM D2564.
- 8) Thread Lubricant Teflon Tape.

2.2 PLASTIC MARKING TAPE

Plastic marking tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in TABLE 1 and shall bear a continuous printed inscription describing the specific utility. Tape shall be a minimum of 3-inch width.

Red:	Electric
Blue:	Water Systems
Purple:	Leachate
Yellow:	Transfer Line

2.3 HDPE PIPE

This section includes High Density Polyethylene (HDPE) Pipe used in the ERDF landfill including but not limited to:

1. Leachate collection piping on floor and cleanout access pipes on the slopes of the trench.
2. Side slope riser pipes containing submersible sump pumps and level transducers.
3. Sump pump discharge piping.
4. Prefabricated HDPE boots to be placed around all pipe penetrations through the HDPE liner.
5. Double containment piping from Crest Pad Buildings to manholes as shown on the Drawings.
6. Lysimeter pipes.

HDPE pipe shall meet or exceed the requirements of ASTM D3350-08 high-density polyethylene, minimum cell classification values of 345434C. Alternate cell classifications are acceptable if one or more of the six numbers in the cell classification is greater than the minimum.

Pipe joints, fittings and flanged connections shall be joined by thermal butt-fusion.

2.3.1 Resin

Polyethylene resins shall conform to Type PE 3408, PE3608, or CONTRACTOR approved alternate.

Protection shall be provided against ultraviolet light degradation using carbon black, not less than 2 percent well dispersed in the resin.

2.3.2 Quality

The pipe shall have uniform wall thickness and shall be uniform in color, opacity, density, and other physical properties. Pipe shall be homogeneous throughout and free of visible cracks, holes, blisters, bubbles, undispersed raw materials, or any contamination by foreign matter. Any pipe with nicks, scrapes, or gouges deeper than 25 percent of the nominal wall thickness shall be rejected.

2.3.3 Form

Pipe may be supplied in a continuous extruded seamless piece or in sections.

2.3.4 Manufacturer's QC Certificates

Prior to shipment, the HDPE pipe Manufacturer shall submit a quality control certificate for each lot/batch of HDPE pipe provided. A responsible party employed by the HDPE pipe Manufacturer, such as the Production Manager shall sign the quality control certificate. The quality control certificate shall include both:

- a) Lot/batch numbers and identification.
- b) Sampling procedures and results of quality control tests.

2.4 HDPE DOUBLE CONTAINMENT PIPE

2.4.1 Pipe Materials

Both carrier pipe and containment pipe shall meet the requirements of HDPE Pipe of this section.

2.4.2 Configuration

Double containment pipe shall consist of factory pre-fabricated components, with a carrier pipe installed within a containment pipe. Pipe and fittings shall provide a continuous annular space between the carrier and containment pipes to accommodate monitoring systems and flow of fluid from the carrier pipe leakage.

2.4.3 Support Spacers

Carrier pipe support spacers shall be HDPE sheet stock ½-inch thick minimum. The support spacing shall be per pipe manufacturer's recommendations and as approved by the CONTRACTOR. The spacers shall maintain the specified annulus between the carrier and containment pipes and shall allow for unrestricted passage of monitoring systems and possible flow of fluid from the carrier pipe. SUBCONTRACTOR is to provide an assembled sample of carrier pipe, spacers, and containment piping the SUBCONTRACTOR is planning to utilize, for CONTRACTOR inspection and approval, prior to ordering the material.

2.4.4 End Seals

Expansion type end seals or fixed end caps shall be used to seal the annulus between the carrier and containment pipes. End seals shall include side ports for monitoring systems or to drain fluid from the annulus. End seals shall be factory manufactured.

2.4.5 HDPE Fittings

Fittings shall conform to the requirements of HDPE Pipe of this section and shall be compatible with the other components of the double containment system. Fittings shall be pre-fabricated with the carrier fitting installed within the containment fitting and containment pipe support spacers installed.

2.5 HDPE COUPLINGS AND END CAPS

2.5.1 Couplings

Couplings for socket fusion shall satisfy the specifications for HDPE Pipe, except that other cell classifications are acceptable provided that they are compatible with the HDPE pipe and provide equivalent performance to class 345434C. Couplings shall satisfy the requirements of ASTM D2513 and shall be manufactured in compliance with ASTM D2683.

2.5.2 Flanged Connections

Where pipes or fittings of different materials are connected, the coupling shall be a flanged connection. The flanges shall be ANSI 150-pound class flanges. The flange joints shall use stainless steel nuts, washers, and bolts. Gaskets shall be utilized when joining to nonpolyethylene materials.

2.5.3 End Caps

Provide molded polyethylene end caps for ends of cleanout access pipes. Caps shall prevent entry of soil or debris into the cleanout pipe and shall be removable. Composition of polyethylene shall be compatible with cleanout pipes per manufacturer's recommendations and shall withstand outdoor conditions.

2.6 PERFORATIONS AND PENETRATIONS

2.6.1 Leachate Collection Piping

Leachate collection piping on the floor of the landfill shall be perforated. Perforations shall be as shown on the drawings.

2.6.2 Sump Pipes

The sump pipes (lower portion of the side slope riser pipes within the sump gravel) shall be perforated as shown on the drawings.

2.7 HDPE FLATSTOCK

2.7.1 Resin

Flatstock shall meet or exceed ASTM D3350 requirements for Type III, Class A, B, or C; Category 3; Grade G5. Flatstock shall be manufactured from first quality polyethylene resin containing no more than 2% clean recycled polymer by weight.

2.7.2 Material Properties

The flatstock shall meet the requirements for specific gravity, carbon black content, and melt index as specified for HDPE Pipe.

2.7.3 Thickness

The flatstock used in the primary sump shall have a nominal thickness of 1 inch. The edges of the flatstock shall have a 0.25 inch bevel.

2.8 BOOTS

The SUBCONTRACTOR shall supply prefabricated HDPE boots conforming to the requirements for geomembrane for miscellaneous applications presented in the Technical Specifications for Cell Construction for penetrations of HDPE pipe through the geomembrane liner (i.e., 0600X-SP-C0077, "Geosynthetics", and 0600X-SP-C0078, "Leachate Collection").

2.9 HDPE PIPE SCHEDULE

HDPE pipe nominal diameter and wall thickness shall be as follows:

Submersible pump discharge piping	1 ½ inch diameter, SDR 11 (non-coiled)
Submersible pump discharge piping	3 inch diameter, SDR 11
Sump level transducer access pipe	Primary: 6 inch diameter, SDR 11 Secondary: 12 inch diameter, SDR 11
Sump/Slope riser pipe	12 inch diameter, SDR 11
Sump/Slope riser pipe	18 inch diameter, SDR 13.5
Double containment pipe 2/6	2 inch diameter, SDR 11 6 inch diameter, SDR 17
Double containment pipe 4/8	4 inch diameter, SDR 11 8 inch diameter, SDR 17

Double containment pipe 10/16	10 inch diameter, SDR 11 16 inch diameter, SDR 17
Perforated leachate pipe	12 inch diameter, SDR 11
Lysimeter Access Pipe (perforated and solid walled)	8 inch diameter, SDR 11

2.10 VALVES

2.10.1 Gate Valves

Gate valves shall be designed for a working pressure of not less than 200 psi. Valve connections (the connection shall allow for replacement/removal of the valve) shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. An arrow and either the word "open" or "close" shall be cast or permanently affixed on the handwheel to indicate the appropriate direction to turn the handwheel.

- a. Valves 3 inch and larger shall be iron body resilient seat, wedge type, bronze mounted, non-rising stem and shall conform to AWWA C509.

2.10.2 Ball Check Valves

Furnish and install check valves sized as shown on the Drawings. Type I, Grade I polyvinyl chloride body, single or dual union socket weld ends, rated 150 psi at 120 degrees F.

Ball check valves shall be Plast-O-Matic CKS 150VS-NC-PV or CONTRACTOR approved alternate.

2.10.3 Ball Valves

Furnish and install ball valves sized as shown on the Drawings. Rated 150 psi with ASTM D1784, Type I, Grade 1 polyvinyl chloride body, ball and stem, end entry, double union design, solvent weld socket ends, or single union ball valve with flanged ends drilled to ASME B 16.5, Class 150, elastomer seat, Viton or Teflon O-ring stem seals, full ported ball. Ball valves shall be Hayward True Union or contractor approved alternate.

2.10.4 Valve Schedule (Each Crest Pad Building)

<u>Valve No.</u>	<u>Description</u>
CV1	1 1/2 inch check valve
CV2	1 1/2 inch check valve
CV3	3 inch check valve

BV1, BV11	1 1/2 inch manually operated ball valve, discharge line
BV2, BV22	1 1/2 inch manually operated ball valve, recirculation line
BV3, BV33	3 inch manually operated ball valve
BV4	1 1/2 inch manually operated ball valve

2.11 FLOW METERS

The SUBCONTRACTOR shall furnish and install meters and flow measurement devices with associated instrumentation and controls as shown and specified herein, complete and operable, for functions including flow measurement and batch metering of fluids including leachate, in accordance with the requirements of the Subcontract Documents.

2.11.1 Paddle Meters

The SUBCONTRACTOR shall furnish and install the following paddle meters:

I.D. No.	Service	Location/ Cell	Pipe Size	Flow Range	Inlet Pressure in W.C.	Service Temp.
2-M-26	Leachate	9	3 inch	0-200 gpm	50 ft	70 °F
2-M-27	Leachate	9	1 inch	0-30 gpm	70 ft	70 °F
2-M-28	Leachate	9	1 inch	0-30 gpm	70 ft	70 °F
2-M-29	Leachate	10	3 inch	0-200 gpm	50 ft	70 °F
2-M-30	Leachate	10	1 inch	0-30 gpm	70 ft	70 °F
2-M-31	Leachate	10	1 inch	0-30 gpm	70 ft	70 °F

The paddle wheel insertion meter shall be constructed of materials suitable for the intended service. The meter stem shall contain an electronic pickup, sensing the passage of each rotor blade. A pulsed output obtained shall produce a repetition rate directly related to flow velocity. The meter shall be capable of registering flow with an accuracy of ± 2 percent over a 10 to 1 range, with a negligible pressure loss.

The meter inserts shall be made of Type 316 stainless steel or of plastic material suitable for the intended service. The shaft material shall be stainless steel, titanium, or Hastelloy. The paddle wheels shall be of Type 316 stainless steel or suitable plastic.

The meter inserts shall be mounted securely through a screwed, flanged, welded, or socket-welded tee connection or fitting, for precise positioning in the pipeline. The fittings shall be of the same material as the pipeline unless otherwise called out. The mounting hardware or probe shall include a clear indicating device to correctly position the meter insert in the pipeline.

A transmitter shall be provided for remote indication of flow and totalized quantity.

The Paddle Meter shall be +GF+Signet Model No. P51530-PO standard mount paddlewheel or CONTRACTOR approved alternate.

The flow meter gauge shall be +GF+Signet Model 5500 flow monitor or CONTRACTOR approved alternate.

2.12 MANHOLES

Precast reinforced concrete manhole sections shall conform to ASTM C478. Joints shall be cement mortar, or an approved mastic or rubber gasket, or an approved combination of these types. Ladders shall be constructed on OSHA 1910 safety standards. Steel ladders and inserts shall be galvanized after fabrication in conformance with ASTM A123/A123M.

2.13 FLOOD SWITCHES

Flood switches shall be water tight and capable of being submersed without adversely effecting electrical signal components. Flood switches shall be Genuine B indicator, Model GT-1/micro switch LAG110760 or CONTRACTOR approved alternate.

2.14 MISCELLANEOUS ITEMS

2.14.1 Valve Nameplates

Exposed valves shall have an attached stainless steel nameplate to list the manufacturer's name, address, component type or style, model or serial number, catalog number, capacity or size, and the system that is controlled. Plates shall be fixed in prominent locations with nonferrous screws or bolts. Valves shall be tagged with valve number in accordance with drawings.

2.14.2 Service Clamps

Service clamps shall have a pressure rating not less than that of the pipe to be connected and shall be the double flattened strap type. Clamps shall have a galvanized malleable-iron body with cadmium-plated straps and nuts. Clamps shall have a rubber gasket cemented to the body.

2.14.3 Pipe Supports

Drawings may not indicate pipe supports necessary to adequately support piping. Pipe supports in crest pad building shall consist of prefabricated galvanized double channel sections commercially manufactured for this purpose. Supports shall allow for vertical adjustment after erection. Supports shall be capable of supporting the piping and associated equipment as shown on the Drawings. Pipe shall be attached to channel sections using standard pipe clamps of correct dimension for the pipe. Pipe supports and accessories shall be hot-dipped galvanized and shall be provided from a single manufacturer. Pipe supports and accessories shall conform to MSS SP-58 and MSS SP-69.

3.0 EXECUTION

3.1 IDENTIFICATION OF PIPING

Identification of exposed pipes shall be accomplished by color-coding with bands and by lettering as specified in this specification. Color bands shall either be painted directly upon the pipe or shall be pressure-sensitive adhesive-backed vinyl cloth or plastic tape.

3.1.1 Labels

Each pipe identification shall consist of 2 color-coded bands, a printed label identifying the name of the pipe, and a flow arrow to indicate direction of flow in the pipe. Labels shall be preprinted on pressure-sensitive adhesive-backed vinyl cloth or plastic tape. Arrows shall be die-cut of the same type of material as the labels. Labels shall be placed on the outside of insulated piping systems.

3.1.2 Lettering

Letter sizes and colors for lettering, arrows, and background shall conform to ANSI A13.1.

3.2 IDENTIFICATION OF VALVES AND SHORT PIPE LENGTHS

3.2.1 General

Identifying devices for valves and the sections of pipe that are too short to be identified with color bands, lettered labels, and arrows shall be identified with metal tags as specified herein.

3.2.2 Tags

Metal tags shall be 16-gauge Type 304 stainless steel metal strips $\frac{3}{4}$ inch wide with $\frac{3}{16}$ -inch high letters stamped on the metal surface. Tags shall be designed to be firmly attached to the valves or short pipes or to the structure immediately adjacent to such valves or short pipes. Tags shall not interfere with equipment operations (i.e. valves, pumps, etc.)

3.3 PIPE INSTALLATION

3.3.1 Cutting of Pipe

Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the CONTRACTOR, cutting shall be done with an approved type mechanical cutter. Wheel cutter shall be used when practicable. Squeeze type mechanical cutters shall not be used for ductile iron or stainless steel pipe.

3.3.2 Joint Deflection

3.3.2.1 Flexible Plastic Pipe. Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the CONTRACTOR, but in no case shall it exceed 5 degrees.

3.3.3 Placing and Laying

Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other CONTRACTOR approved equipment. Under no circumstances shall any of the water-line materials be dropped or dumped into the trench. Care shall be taken to avoid abrasion of the pipe coating. Except where necessary to make connections with other lines or as authorized by the CONTRACTOR, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the coating or lining is damaged, the repair shall be made by the SUBCONTRACTOR at his expense in a satisfactory manner. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored, as shown.

3.3.3.1 Plastic Pipe Installation. PVC shall be installed in accordance with AWWA M23.

3.3.4 Connections

Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. Where made under pressure, these connections shall be installed using standard methods as approved by the CONTRACTOR.

3.3.5 Penetrations

Pipe passing through walls of valve pits and structures shall be provided with ductile-iron or Schedule 40 steel wall sleeves unless shown otherwise on the Drawings. Annular space between walls and sleeves shall be filled with rich cement mortar. Annular space between pipe and sleeves shall be filled with mastic.

3.3.6 Flanged Pipe

Flanged pipe shall only be installed above ground or with the flanges in valve pits.

3.3.7 Jointing

3.3.7.1 Polyvinyl Chloride (PVC) Plastic Pipe

- a. Pipe less than 4 inch diameter: Threaded joints shall be made by wrapping the male threads with approved thread tape or applying a CONTRACTOR approved lubricant, then threading the joining members together. The joint shall be tightened using strap wrenches to prevent damage to the pipe and fitting. To avoid excessive torque, joints shall be tightened no more than one thread past hand-tight. Solvent cement joints shall use sockets conforming to the requirements of ASTM D2467. The solvent cement used shall meet the requirements of ASTM D 2564; the joint assembly shall be made in accordance with ASTM D2855 and the manufacturer's specific recommendations.
- b. Pipe 4 inch through 12 inch diameter: Joints shall be elastomeric-gasket as specified in AWWA C900. Jointing procedure shall be as specified for pipe less than 4 inch diameter with configuration using elastomeric ring gasket.

3.3.7.2 Connections. Connections between different types of pipe and accessories shall be made with transition fittings approved by the CONTRACTOR.

3.3.8 Crest Pad Valves and Drain Lines

Valves shall be installed in accordance with AWWA Standards and manufacturer's recommendations

3.3.9 Pipe Supports

The pipe support system shall be installed in accordance with MSS SP-58, MSS SP-69, and the piping support system manufacturer's recommendations. Piping shall be rigidly supported and anchored so that there is no movement or visible sagging between supports.

3.4 HDPE PIPE INSTALLATION

- a. Pipe shall be handled and stored in such a manner as to ensure a sound, undamaged condition.
- b. Pipe shall be cut in a neat, workmanlike manner using a CONTRACTOR (based on manufacture information) approved mechanical cutter that will not damage the pipe.
- c. Joining of HDPE pipe to HDPE pipe shall be accomplished by thermal butt or electrofusion; no solvent or adhesive welding shall be allowed. Pipe shall be joined per ASTM F2620 and manufacturer's recommendations. Installation personnel who join HDPE pipe shall be experienced and certified in accordance

with pertinent sections of 49 CFR 192.285. The SUBCONTRACTOR shall submit a list of proposed joining personnel and their qualifications.

Single butt fusion welds shall be used to create pipe sections as long as practicable or as specified in the SUBCONTRACTOR's procedure. Fabricated pipe sections and fittings shall be joined by the double butt fusion process.

- d. During installation, the pipe shall not be pulled across sharp projections that could cause gouges, kinks, or other types of damage.
- e. The pipe shall not be dropped into the trench. The full length of the pipe shall be firmly bedded on the trench bottom. The pipe shall be bedded in such a way as to maintain grade with a tolerance of -0.0%, +0.5%.
- f. Temporarily close pipe ends and all perforations as required to avoid introducing dirt or other foreign material into the pipe. Dirt and other foreign material shall be removed before installation.
- g. Trenching and backfilling operations shall be conducted in accordance with the requirements of the Technical Specification for Site Work. Backfilling operations shall ensure that no voids are present under and at the sides of the pipe. Backfill shall initially be placed to the top of the pipe, and then hand compacted. The remainder of the trench shall then be backfilled and compacted by hand or with a power tamper only.
- h. Where flanged joints are used, the bolts shall be evenly torqued with a crossing pattern to gradually tighten the lug nuts. Flanged joints shall be retorqued after one hour or more has passed. Torque records shall be provided.
- i. Boots shall be welded to the surrounding liner and the HDPE pipe using methods specified in the Technical Specification for Cell Construction-Geosynthetics, as applicable.
- j. Flaws (minor imperfections, damaged areas, etc.) in HDPE pipe with a depth of 10% or less of the nominal wall thickness will not require repair or replacement. In double containment systems, carrier pipes with flaws deeper than 10% of the wall thickness shall be replaced. Single pipe or containment pipe with flaws between 10% and 25% of the wall thickness shall be repaired in accordance with the pipe manufacture's recommendations. The SUBCONTRACTOR shall certify in writing that the repaired area will have material properties that meet or exceed those of intact pipe. Any pipe with flaws deeper than 25% of the nominal wall thickness will be replaced.
- k. HDPE pipe thermal butt or electrofusion welding procedures shall be submitted.

- l. Sideslope Riser Pipes. With pipe in final location, insert submersible pump, discharge piping, and wiring to check pump location and to demonstrate that pipe is free from obstructions. Document and submit this check.
- m. Sump Level Transducer Access Pipes. With pipe in final location, insert to measurement location to demonstrate that pipe is free from obstructions. Document and submit this check.
- n. Weld Beads. Remove internal weld beads from the HDPE pipe installed on the side slopes and in the sumps where the leachate pumps and transducers will be installed. Remove debris from inside of pipes. The extracted internal fusion beads shall be subjected to visual inspection and conformation of its removal. Visual inspection shall include:
 - Verification that complete internal fusion bead removal was performed (This may be accomplished through examination of the extracted internal fusion bead, or by way of CCTV).
 - The extracted internal fusion bead appearance shall have the same double roll back semblance as does the external fusion bead.
 - The extracted internal fusion bead shall possess a smooth root cut, or verification of pipe smoothness by use of CCTV.
 - Removal of the internal bead may include pipe wall mass. However any wall mass that is removed should not exceed 1/10th of the pipe wall thickness itself.

3.5 ACCEPTANCE TESTING

The SUBCONTRACTOR shall perform acceptance testing of all non-perforated pipelines that carry liquid. Riser pipes functioning as carrier pipes for leachate pumps and level monitoring equipment do not require acceptance testing. Where the pipes will be covered with liner, gravel, soil, etc., the SUBCONTRACTOR shall complete the required testing and receive approval by the CONTRACTOR prior to burying the pipe or covering the pipe.

Testing procedures shall be submitted.

CONTRACTOR shall be notified prior to performing acceptance testing. CONTRACTOR, or others designated by the CONTRACTOR, shall witness acceptance tests. Failure to notify the CONTRACTOR 24 hours, prior to testing, may cause the SUBCONTRACTOR to postpone or perform the test again.

3.5.1 General

Provide test equipment and materials, including test pumps, gauges, water, volumetric measuring equipment, and other equipment required. Pressure gauges used shall be graduated in increments not greater than 1 psi and shall have range of approximately twice the test pressure. Use only calibrated gauges and instruments. Provide calibration certificates traceable to NIST. Gauge serial numbers shall be traceable to tests performed. Specify the allowable tolerance for testing pressures.

Test in accordance with applicable provisions of ASME B31.3, normal fluid service, as modified by the requirements of this section.

Hold test pressure for 1 hour. Test time will be accrued only while full test pressure is applied to system. After the pressure has been increased to the required test value and held for one hour, the pressure is to be decreased to 0 psi while observations are made for leakage. The pressure is again to be slowly increased to the value specified in the above paragraph and held for one more hour while observations are made for leakage and the leakage measurement is made.

The pipeline should be prepared 24 hours prior to testing by filling it with water, in a manner to remove air (piping sections with elevation changes shall be vented in accordance with a fill and venting procedure prior to testing). The test pressure should be applied to stabilize the system. This should minimize losses due to entrapped air, changes in water temperature, distention of components under pressure, movement of gaskets, and absorption of air by the water and water by the pipe wall.

During testing, remove from systems any equipment that would be damaged by test pressure. Replace removed equipment after testing. Where new pipe connects to existing piping, the joint between the two pipes shall be tested. Correct leaks by remaking joints with new material; makeshift remedies will not be permitted. Welded pipe attachments (hangers, etc.) shall be installed prior to testing.

Systems may be tested in sections as work progresses; however, any previously tested portion shall become a part of any later test of composite system. Test records shall include marked up drawings indicating which piping was tested.

The SUBCONTRACTOR shall be responsible for providing temporary fillings, plugs, and thrust blocking for testing at the specified pressure.

There shall be no indications, visible or otherwise of leakage, unless specified otherwise, for the piping at the specified test pressure throughout the specified duration.

Tests shall be made by the SUBCONTRACTOR in the presence of the CONTRACTOR. The certificate shown in NFPA 24 Figure 10.10.1 shall be completed by SUBCONTRACTOR.

Additives, corrosive chemicals such as sodium silicate, brine, or other chemicals shall not be used while hydrostatically testing systems or for stopping leaks.

3.5.2 Buried Pipe Testing

The trench shall be backfilled between joints before testing to prevent movement of pipe. Tests shall be made before the joints are covered so that any leaks may be readily detected. Where any section of a pipe is provided with concrete thrust blocking, the tests shall not be made until at least 5 days after installation of the concrete thrust blocking, unless otherwise approved by the CONTRACTOR. If the joints are covered with backfill prior to testing, the SUBCONTRACTOR remains responsible for locating and correcting any leakage in excess of that permitted in Section 3.4.1.

3.5.2.1 HDPE Pump Discharge Pipes

Pressure test to 70 psi with gage located in crest pad building.

3.5.2.2 PVC Crest Pad Pipe

Test with piping in final location. Pressure test to 70 psi with gage located in crest pad building.

3.5.2.3 HDPE Double Contained Pipe

Test with piping in final location. Pressure test single containment piping to 30 psi. Pressure test the carrier pipe (inner pipe) of double containment piping to 30 psi and the containment pipe (outer pipe) of double containment piping to 10 psi. Hydrostatic or pneumatic pressure tests shall be used to test the containment pipe of the double containment piping. Pneumatic tests, if used, shall be performed as specified in Section 3.5. Carrier pipe (inner pipe) shall be full of water when containment pipe is pressure tested.

Document and submit the flush, flow rate, and flush time.

3.5.3 Raw Water Pipe

Permanent raw water lines installed by the SUBCONTRACTOR to support construction activities shall be tested hydrostatically at 150 psi for two hours.

Minimum test procedure is as follows: The water pressure is to be increased in 50-psi increments until the test pressure is attained. After each increase in pressure, observations are to be made of the stability of the joints. These observations are to include such items as protrusion or extrusion of the gasket, leakage, or other factors likely to affect the continued use of a pipe in service. During the test, the pressure is not to be increased by the next increment until the joint has become stable. This applies particularly to movement of the gasket. After the pressure has been increased to the required test value and held for one hour, the pressure is to be decreased to 0 psi while observations are made for leakage. The pressure is again to be slowly increased to the value specified in the above paragraph and held for one more hour while observations are made for leakage and the leakage measurement is made.

The amount of leakage in buried piping shall be measured at the specified test pressure by pumping from a calibrated container. For new pipe, the amount of leakage at the joints shall not exceed two quarts per hour per 100 gaskets or joints irrespective of pipe diameter. No visible leakage shall be allowed in aboveground piping. The amount of allowable leakage shall be permitted to be increased by one fluid ounce per inch valve diameter per hour for each metal seated valve isolating the test section.

3.6 CLEANING

Clean all piping as required to remove foreign materials including dirt, grease, shavings, and other matter. Debris and surplus materials resulting from work, as a result of this installation effort, shall be removed.

3.7 QUALITY ASSURANCE/QUALITY CONTROL

Construction Quality Control and Testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR, or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the filing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall maintain and supply to CONTRACTOR records of his quality control for operations including but not limited to the following:

- (1) Delivery, storage, and handling of devices and equipment used.
- (2) Conformance of materials to the requirements of this specification.
- (3) Inspection of devices and equipment installed
- (4) Field testing of devices and equipment.
- (5) Installation of devices and equipment to these requirements and applicable codes and standards.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be furnished to the CONTRACTOR within 1 working day following the inspection or test.

SPECIFICATION FOR

TECHNICAL SPECIFICATION FOR LEACHATE PUMPS

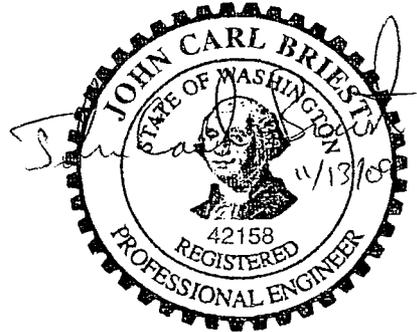
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF) CELLS 9 & 10 CONSTRUCTION

DOCUMENT CONTROL *mjp 11/24/09*

RECEIVED

NOV 19 2009

**WCH - DOCUMENT
CONTROL**



JOB NO. 14655

WASHINGTON CLOSURE HANFORD
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed.
 2. Revise and resubmit. Work may proceed prior to resubmission.
 3. Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments.
 4. Revise and resubmit. Work may not proceed.
 5. Permission to proceed not required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any 'holds' placed on the contract.

GENERAL	FIELD ENGINEER	PROJECT ENGINEER	SAFETY	ENVIRONMENTAL	PROJECT MGR	QA/QC	INSPECTION	CONSTRUCTION	STRUCTURAL	ELECTRICAL	MATERIALS	PROCESS	OTHER
		✓			B								

Project Engineer: *W.A. Bristow*
 Date: 11-23-2009
 DOCUMENT ID NUMBER: 506X524HADDN03-05-011-013
 SCS ITEM: SUBMITTAL
 SCFD. NO.

Rev.	Date	Reason for Revision	Originator	Checker	Project Engineer	LEAD Design Eng.
0	11/13/09	Issued for Award	<i>WJM</i>	<i>NCW</i>	<i>WAB</i>	<i>SCB</i>

Washington Closure Hanford, LLC	RIVER CORRIDOR CLOSURE CONTRACT	Job No. 14655 Specification No. 0600X-SP-M0033 Page 1 of 9
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LEACHATE PUMPS

CONTENTS

1.0	GENERAL.....	3
1.1	SUMMARY.....	3
1.2	ABBREVIATIONS	3
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS	3
1.4	GENERAL REQUIREMENTS.....	3
	1.4.1 Standard Products	3
	1.4.2 Description.....	4
	1.4.3 Nameplates.....	4
	1.4.4 Electrical Work	4
	1.4.5 Selection Criteria	4
	1.4.6 Conformance with Agency Requirements.....	4
	1.4.7 Verification of Dimensions.....	4
	1.4.8 Factory Tests.....	5
1.5	TECHNICAL SUBMITTALS.....	5
	1.5.1 Materials and Equipment.....	5
	1.5.2 Pump Systems.....	5
	1.5.3 Tests.....	5
	1.5.4 Operation and Maintenance Manuals	5
1.6	DELIVERY AND STORAGE	6
2.0	PRODUCTS.....	6
2.1	MATERIALS AND EQUIPMENT	6
2.2	SUBMERSIBLE PUMPS.....	6
	2.2.1 General.....	6
	2.2.2 Low-Capacity Submersible Pumps.....	7
	2.2.3 High-Capacity Submersible Pump.....	8
3.0	EXECUTION.....	8
3.1	INSTALLATION	8
3.2	LABELS AND TAGS	8
3.3	TESTS.....	8
3.4	DEMONSTRATION.....	9
3.5	QUALITY ASSURANCE/QUALITY CONTROL	9

LEACHATE PUMPS

1.0 GENERAL

1.1 SUMMARY

This specification establishes quality and workmanship requirements and defines how quality is measured for Equipment.

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

ANSI	American National Standards Institute
ERDF	Environmental Restoration Disposal Facility
HDPE	High Density Polyethylene
HI	Hydraulic Institute
NEMA	National Electrical Manufacturers Association
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Plan
SSRS	Subcontractor/Supplier Submittal Requirements Summary

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Equipment. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Equipment. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

HI-01 Hydraulic Institute Standards for Centrifugal, Rotary & Reciprocating Pumps

NEMA MG 1 Motors and Generators

1.4 GENERAL REQUIREMENTS

1.4.1 Standard Products

Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate equipment that has been in satisfactory operation at least 5 years prior to bid opening. Pumps and motors of the same types shall each be the product of one manufacturer.

1.4.2 Description

The pumps shall be of the types indicated and specified. The single driving units for the pumps shall be electric motors as indicated and specified.

1.4.3 Nameplates

Pumps and motors shall have a stainless steel nameplate securely affixed (attaching hardware to be stainless steel also) in a conspicuous place showing the manufacturer's name, address, type or style, model, serial number, catalog number and equipment tag number. In addition, the nameplate for each pump shall show the pump identification number, capacity in gpm at rated speed in rpm, and head in feet of water. Nameplate for each electric motor shall show at least the minimum information required by 10.38 NEMA MG 1.

1.4.4 Electrical Work

Electrical motor driven equipment specified herein shall be provided complete with motors, motor starters, and controls. Electric equipment and wiring shall be in accordance with the Technical Specification for ELECTRICAL WORK. Electrical characteristics shall be as indicated. Motor starters shall be provided complete with properly sized thermal overload protection in each phase and other appurtenances necessary for the motor control specified. Each motor shall be of sufficient capacity to drive the equipment at the specified capacity without exceeding the nameplate rating of the motor when operating at proper electrical system voltage and frequency. Manual and automatic controls and protective/ signal devices required for the operation and any control wiring required for controls and devices but not shown on electrical plans shall be provided under this section of the specifications.

1.4.5 Selection Criteria

Pumps shall be designed using hydraulic criteria based upon actual model developmental test data. Pumps shall be selected at a point within the maximum efficiency for a given impeller casing combination. Deviations within 3 percent of maximum efficiency are permissible, provided the lesser efficiency is not less than the scheduled efficiency.

1.4.6 Conformance with Agency Requirements

Where materials or equipment are specified to be an approved type, the seal or label of approval from a nationally recognized testing agency, adequately equipped and competent to perform such services, shall be attached thereto.

1.4.7 Verification of Dimensions

The SUBCONTRACTOR shall verify dimensions in the field and shall advise the CONTRACTOR of any discrepancy before performing the work.

1.4.8 Factory Tests

The manufacturer or a nationally recognized testing agency shall test each pump in compliance with ANSI/HI 11.6, Level B. Certified test results shall be submitted to the CONTRACTOR.

1.5 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.5.1 Materials and Equipment

Manufacturer's descriptive data and technical literature, performance charts and curves for impeller sizes for a given casing, catalog cuts, and installation instructions, spare parts data for each different item of material and equipment specified, after approval of the detail drawings will be submitted not later than 75% of construction completion date. Data shall include a complete list of parts and supplies, with current unit prices and source of supply.

1.5.2 Pump Systems

Submit a complete listing of equipment and materials. Drawings shall contain complete "as-built" wiring and schematic diagrams and any other details required demonstrating that the system has been coordinated and will properly function as a unit. Drawings shall show proposed layout and anchorage of equipment and appurtenances, and equipment relationship to other parts of the work including clearances for maintenance and operation.

1.5.3 Tests

Test reports in booklet form showing field tests performed to adjust each component and field tests performed to prove compliance with the specified performance and operating criteria, upon completion and testing of the installed system. Each test report shall indicate the final position of controls.

1.5.4 Operation and Maintenance Manuals

Six complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment. The manuals shall be submitted not later than at the 75 percent of construction completion date. Each set shall be permanently bound and shall have a hard cover. The following identification shall be inscribed on the covers: the words "OPERATING AND MAINTENANCE INSTRUCTIONS", name and location of the building, name of the SUBCONTRACTOR, and Subcontract number. Flysheets shall be placed before instructions covering each subject. Instruction sheets shall be approximately 8-1/2 by 11 inches, with large sheets of drawings folded in. Instructions shall include, but not be limited to the following:

- a. As-built System layout showing piping, valves, and controls.
- b. Approved as-built wiring and control diagrams.
- c. A control sequence describing startup, operation, and shutdown.
- d. Operating and maintenance instructions for each piece of equipment, including lubrication instructions and troubleshooting guide.
- e. Manufacturer's bulletins, cuts, and descriptive data; and parts list and recommended spare parts.

1.6 DELIVERY AND STORAGE

Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

2.0 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Materials and equipment shall be as specified below and as shown, and shall be suitable for the service intended. Materials and equipment shall be new and unused, except for tests. Where two or more pieces of equipment performing the same function are required, they shall be duplicate products of the same manufacturer.

2.2 SUBMERSIBLE PUMPS

2.2.1 General

- a. The low-capacity submersible pumps in the primary and secondary leachate collection systems of the ERDF trench.
- b. The high-capacity submersible pump in the primary leachate collection system only.
- c. Pumps and motors shall be constructed such that wetted parts (including housing, fasteners, shaft, diffuser chamber, and impellers) are stainless steel, e.g. type 304 or 316 stainless steel, Teflon, and other highly corrosion resistant materials. Gaskets, o-rings, and seals shall have compatibility properties equivalent to viton materials as a minimum.
- d. The pump and motor shall have bearings that permit the pump to be operated in continuous or intermittent service in the horizontal position. The pump shaft shall

be type 304, 316, or 17-4 stainless steel and rotate on bearings that are product-lubricated.

- e. The external portions of the case shall be free of sharp edges or burrs which would damage the HDPE slope riser pipes, or which might prevent the free travel of the pump along the enclosing pipe.
- f. The pumps shall be permanently mounted on factory-installed wheeled trolley assemblies to facilitate placement and removal from the riser pipes. Trolley assemblies shall be free of sharp edges or burrs.
- g. Each pump shall be fitted with a stainless steel lifting cable of sufficient strength to install and remove the pump unit, discharge line, power cable, and any other associated equipment.
- h. Each pump shall have 1/4 inch hole drilled into check valve to allow water to drain from discharge piping.
- i. The motors shall be submersible, hermetically sealed (suitable for continuous horizontal submerged service), and constructed of 316 stainless steel. Motors shall be wired to run on three phase, 480 Volt, 60 Hz service.
- j. Pumps shall be commercially available units from a manufacturer normally engaged in the production of leachate removal pumps for horizontal installations through side slope riser pipes.
- k. The low-capacity submersible pumps shall be capable of draining the sump to the lowest level possible, but in any case shall drain to less than 1 foot. The high capacity submersible pumps shall be capable of draining the sump to less than 1.2 feet.
- l. Pumps shall be equivalent to centrifugal submersible SurePump Wheeled Sump Drainers as manufactured by EPG Companies, Inc. or as approved by CONTRACTOR.

2.2.2 Low-Capacity Submersible Pumps

- a. The low-capacity submersible pumps for both primary and secondary leachate collection systems shall be identical.
- b. The low capacity submersible pumps shall be rated approximately as follows:

RATED CAPACITY: 15 gpm
TOTAL DYNAMIC HEAD: 140 feet

c. Schedule:

Cell	Pump No	Description
9	2-P-33	Primary Sump (Pump 2)
9	2-P-34	Secondary Sump (Pump 3)
10	2-P-36	Primary Sump (Pump 2)
10	2-P-37	Secondary Sump (Pump 3)

2.2.3 High-Capacity Submersible Pump

a. The high-capacity submersible pump shall be rated approximately as follows:

RATED CAPACITY 140 gpm
TOTAL DYNAMIC HEAD 130 feet

b. Schedule:

Cell	Pump No	Description
9	2-P-32	Primary Sump (Pump 1)
10	2-P-35	Primary Sump (Pump 1)

3.0 EXECUTION**3.1 INSTALLATION**

Each pump shall be installed in accordance with the written instructions of the manufacturer.

3.2 LABELS AND TAGS

Label and tag valves, indicators, piping, disconnects, equipment, switches etc., per the specifications and associated drawings.

3.3 TESTS

After installation of the pumping units and appurtenances is complete, operating tests shall be carried out to assure that the pumping installation operates properly. Each installed pumping unit shall be given a running field test in the presence of the CONTRACTOR for a minimum of 2 hours. Each pumping unit shall be operated at its rated capacity or such other point on its head-capacity curve selected by the CONTRACTOR. The SUBCONTRACTOR shall provide an accurate and acceptable method of measuring the discharge flow. Tests shall assure that the units and appurtenances have been installed correctly, that there is no objectionable heating, vibration, or noise from any parts, and that manual and automatic controls function properly. If

any deficiencies are revealed during any tests, such deficiencies shall be corrected and the tests shall be reconducted.

3.4 DEMONSTRATION

Upon completion of the work and at a time designated by the CONTRACTOR, the services of one or more competent engineers shall be provided by the SUBCONTRACTOR for a period of not less than 4 hours to instruct a representative of the CONTRACTOR and the ERDF Disposal Subcontractor in the operation and maintenance of equipment furnished under this section of the specifications.

3.5 QUALITY ASSURANCE/QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR, or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall maintain and supply to CONTRACTOR records of his quality control for operations including but not limited to the following:

- 1) Delivery, storage, and handling of devices and equipment used.
- 2) Conformance of materials to the requirements of these specifications.
- 3) Inspection of devices and equipment installed.
- 4) Field testing of devices and equipment.
- 5) Installation of devices and equipment to these requirements and applicable codes and standards.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be furnished to the CONTRACTOR within 1 working day following the inspection or test.

EXHIBIT "E"

TECHNICAL SPECIFICATION

FOR

SUBCONTRACTOR PREPARED DESIGN DRAWINGS

DOCUMENT CONTROL mlc 2/3/09

3	2/3/09	Update of As-built and Design Change Requirements	<i>CAB</i>	<i>BJK</i>	<i>mw</i>	<i>gnd</i>
2	6/26/08	Reissue for Use	CAB	BAC	JNW	JNW
1	3/19/08	Revised for use per IF-2007-1034	CAB	BAC	JNW	JNW
0	11/16/07	Issued for Project Use	CAB	BAC	GBS	GBS
REV.	DATE	REASON FOR REVISION	ORIGINATOR	CHECKER	PROJECT ENGINEER	LEAD Design Engineer
WASHINGTON CLOSURE HANFORD LLC		RIVER CORRIDOR CLOSURE CONTRACT	JOB NO. 14655			
			SPECIFICATION NO.		0000X-SP-X0001	
			SHEET 1 of 17 <i>mw</i>			

TECHNICAL SPECIFICATION SUBCONTRACTOR PREPARED DESIGN DRAWINGS

CONTENTS

1.0	GENERAL.....	3
1.1	SUMMARY.....	3
1.2	ABBREVIATIONS.....	3
1.3	STANDARDS.....	3
1.4	DEFINITIONS.....	3
2.0	CAD SOFTWARE STANDARD.....	4
3.0	UNIFORM DRAWING TITLE BLOCK FORMATS.....	4
3.1	PROJECT DESIGN DRAWINGS PREPARED BY SUBCONTRACTORS.....	4
4.0	STANDARD SHEET SIZES.....	7
5.0	DISCIPLINE LAYERING STANDARDS.....	7
6.0	PEN TABLE STANDARDS.....	7
7.0	AUTOCAD SUPPORT FILES.....	7
8.0	NOTES, ABBREVIATIONS, AND SYMBOLS.....	7
9.0	GENERAL DRAFTING PRACTICES.....	8
9.1	LETTERING.....	8
9.2	DIMENSIONING.....	8
9.3	LEADER LINES.....	8
9.4	SECTIONS, ISOMETRICS, AND DETAILS.....	8
9.5	NORTH ARROW.....	8
9.6	REVISION TRIANGLE AND "CLOUD".....	9
9.7	PLOTTING.....	9
9.8	SCALES.....	9
10.0	CADD FILE SUBMITTAL.....	9
11.0	DRAWING NUMBERS.....	9
12.0	FILE NAMING.....	10
13.0	BASEMAP CREATION.....	11
14.0	MAP COORDINATE SYSTEM.....	11
15.0	DRAWING DESIGN CHANGE PROCESS.....	12
16.0	AS-BUILT DRAWINGS.....	12

ATTACHMENTS

ATTACHMENT A – SUBCONTRACTOR PROJECT DESIGN DRAWING TITLE BLOCK CONFIGURATION.....	15
ATTACHMENT B – STANDARD DRAWING SHEET SIZES.....	16
ATTACHMENT C – DRAWING LAYOUT.....	17

**TECHNICAL SPECIFICATION
FOR
SUBCONTRACTOR PREPARED DESIGN DRAWINGS**

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for SUBCONTRACTOR prepared design drawings that are consistent in format for the Hanford River Corridor Closure Contract (RCCC) under the administration of Washington Closure Hanford (WCH).

1.2 ABBREVIATIONS

The abbreviations listed below where used in this specification, shall have the following meanings:

ANSI American National Standards Institute

1.3 STANDARDS

Unless otherwise approved or shown, the following American National Standards of the latest issue at the time of award shall apply to establish the minimum requirements for drawing activities within the scope of this specification.

ANSI Y14.1 Engineering Drawings and Related Documentation Practices, Drawing Sheet Sizes and Formats

1.4 DEFINITIONS

NAD 83 (91): North American Datum of 1983, adjusted in 1991.

NAVD (88): North American Vertical Datum of 1988.

Energized Utility Systems - Energized systems include, but are not limited to, the following:

- Electric Power and Control Systems (except telephone and computer systems)
- Pressurized piping systems
- Sanitary and process sewer systems

Issued for Construction – Issued for construction (IFC) drawings are design drawings that are prepared by the SUBCONTRACTOR for the CONTRACTOR's project. IFC drawings may include but are not limited to drawings required for:

- Fabrication of SUBCONTRACTOR-furnished equipment
- Installing SUBCONTRACTOR-furnished material or equipment
- Planning and performance of the Work under the Subcontract
- Installing energized utility systems

The IFC drawings, after review and approval by the CONTRACTOR, form part of the subcontract for the project. Project work is performed in accordance with the IFC drawings and subsequent revisions thereto (see Section 15.0, Drawing Design Change Process).

Working Drawings – Working drawings are the set of IFC drawings which the SUBCONTRACTOR maintains on the jobsite to provide an accurate record of the work installed. The working drawing set shows any deviations between the work as shown on the original IFC drawings and the work as installed. Working drawings are maintained throughout the project.

Initial As-built Drawings – Initial as-built drawings are prepared only to document the construction of a new energized utility system or construction of additions to an existing utility system. The initial as-built drawings consist of the working drawings for the energized utility system which have been updated to show the configuration of the energized utility system once its construction is complete, inspected, approved and placed in service. Initial or final as-builts will not be prepared to document existing buildings with utilities that are being demolished as part of the WCH D4 project. Instead, a project level redline drawing process (see Procedure D4-110-2.12) will be followed to document changes to the existing utility system during the demolition process.

Final As-built Drawings - At the end of a project, the SUBCONTRACTOR prepares a set of final as-built drawings. The final as-built drawings depict the final configuration of the site, facilities, structures, systems, and components which were completed by the SUBCONTRACTOR.

2.0 CAD SOFTWARE STANDARD

AutoCAD Release R-17.1 (AutoCAD 2008) or earlier versions down to AutoCAD 2004 is the standard for preparing design drawings. Any other CAD software used for producing design drawings shall be approved by the WCH CAD supervisor prior to project startup.

3.0 UNIFORM DRAWING TITLE BLOCK FORMATS

Uniform drawing title block formats shall be used by the SUBCONTRACTOR. Title Block formats are available from the WCH CAD supervisor.

3.1 PROJECT DESIGN DRAWINGS PREPARED BY SUBCONTRACTORS

The title block format for the drawings that will be prepared by SUBCONTRACTOR will contain the information shown in Attachment A, “Subcontractor Project Design Drawing Title Block Configuration.” The following numbers and narratives correspond to each area of the title block format shown in Attachment A:

1. **Revision Designator:** The SUBCONTRACTOR shall use letter revision designators, starting with the letter "A" during the preliminary review cycle. After the CONTRACTOR has received and accepted the SUBCONTRACTOR's drawing for use (Submittal Status 2 [Submit final document. Work may proceed.]), the SUBCONTRACTOR shall resubmit the drawing with number revision designator "0" to the CONTRACTOR for final acceptance. When issuing a drawing as "Revision 0," the SUBCONTRACTOR shall remove all references to the previous letter revision designators from the drawing. Once drawings have been issued number revision designators, the process for revisions will repeat and the SUBCONTRACTOR will assign a designator "0A" This designator will cycle through "0B", "0C", etc., until Submittal Status 2 is achieved. After the CONTRACTOR has received and accepted the SUBCONTRACTOR's drawing for use (Submittal Status 2 [Submit final document. Work may proceed.]), the SUBCONTRACTOR shall resubmit the drawing with number revision designator "1" to the CONTRACTOR for final acceptance. This process will repeat as required for new issues and until drawing has served the project's purposes.
2. **Date of Revision:** The SUBCONTRACTOR's Project Engineer (or Lead Engineer) shall enter the date upon approval of the design and the drawing. The actual date is required and shall be entered in the following format: mm/dd/yy.
3. **Description of Issue:** A brief description shall appear in this area identifying the purpose for issuance and/or revision (e.g., "Issued for Preliminary Review," "Issued for Construction," "Issue for Bid," "Issue for As-Built.")
4. **Drafted By:** The individual who graphically produced the drawing shall provide his/her initials in this area (e.g., CAB).
5. **Drafting Check:** All drawings prepared by the SUBCONTRACTOR shall be independently checked by an individual who has a level of qualification at least sufficient to perform the work being checked.
6. **Originator/Engineer:** The individual responsible for originating and providing the design data for the drawing shall initial this block.
7. **Engineering Check:** The individual responsible for checking the technical accuracy of the design and drawing shall initial in this area. All designs and drawings shall be independently checked by an individual who has a level of design qualification at least sufficient to originate the design work being checked.
8. **System Engineer:** This block is typically not applicable for SUBCONTRACTOR prepared design drawings. SUBCONTRACTOR shall confirm with the CONTRACTOR that N/A shall placed in this initial block.
9. **Project Engineer:** The individual responsible for the design being submitted to the CONTRACTOR. After receiving final SUBCONTRACTOR's "Revision 0" drawing, the CONTRACTOR's responsible Project Engineer will provide Status 1 (work may proceed) on the subcontractor/supplier document status stamp to indicate CONTRACTOR's acceptance of the

SUBCONTRACTOR's design and drawing. During the preliminary review cycle (letter revision designator stages), this block shall be "N/A" (not applicable) or left blank.

10. **Scale:** When applicable the drawing scale shall appear here. The words "As Shown" shall be placed here when multiple scales appear on the sheet. The word "Not to Scale" shall be used when a scale is not applicable (e.g., flow diagrams, schematics).
11. **Company Name and Address:** The appropriate name and address of the SUBCONTRACTOR who is responsible for preparing the design drawing for the CONTRACTOR shall appear in this block.
12. **Title:** This area shall be used to identify the subject matter of the drawing. The title will be formatted into three separate line items: project location, action, and drawing type. Example:

*100N Area
Potable Water System
Process Instrumentation Diagram*

13. **WCH Job No.:** This references the WCH Job Number.
14. **DOE Contract No.:** This references the U.S. Department of Energy (DOE), Richland Operations Office Contract No. for the RCCC.
15. **CADD Filename:** This area will provide a CAD filename of the CAD data set. This filename shall be identical to the CAD data set and reflect the adopted convention stated in Section 12.0, File Naming.
16. **Drawing No.:** The drawing number, which complies with the adopted convention (refer to BSC-1-7.4), will be issued to the SUBCONTRACTOR by WCH CAD supervisor.
17. **Task:** For retrieval purposes only, a task identifier complying with the adopted convention will be issued to the SUBCONTRACTOR by the CONTRACTOR.
18. **Revision No.:** This area identifies the current revision status of the drawing.
19. **Record No.:** This number will reference a Record Management/File Archival System. Records and Document Control will issue the record number to the SUBCONTRACTOR.
20. **Bldg No.:** This area will contain the building or area number. Area identification number may be used only when a building number is inappropriate.
21. **Index No.:** An index number shall be issued to the SUBCONTRACTOR by the WCH CAD supervisor for each major category covered by the drawing.

4.0 STANDARD SHEET SIZES

Standard drawing sheet sizes shall be used for all drawings prepared by the SUBCONTRACTOR. Refer to Attachment B, " Standard Drawing Sheet Sizes," for the available sizes. It should be noted that the preferred sheet sizes are D-size and A1-size.

5.0 DISCIPLINE LAYERING STANDARDS

Uniform layering standards have not been provided by the CONTRACTOR to the SUBCONTRACTOR producing design drawings. Layering convention shall be established by the SUBCONTRACTOR's design firm. Layering names shall be clear and contain descriptive contents of the layer components. SUBCONTRACTOR shall provide a master layering name listing in a separate text file with each CAD drawing submitted.

6.0 PEN TABLE STANDARDS

Uniform pen table standards have not been provided by the CONTRACTOR to the SUBCONTRACTOR producing design drawings. Pen table (.ctb files) shall be prepared by the SUBCONTRACTOR's design firm. Pen tables shall be set up to clearly portray the best line weight quality of the contents being shown on the drawing. SUBCONTRACTOR shall provide a pen table(s) (.ctb file) for each CAD drawing submitted as applicable.

7.0 AUTOCAD SUPPORT FILES

SUBCONTRACTOR shall provide all AutoCAD support files to the CONTRACTOR as part of the CAD data submittal. The support files shall include but not be limited to external reference drawings, image files, font files, line type files, etc.

8.0 NOTES, ABBREVIATIONS, AND SYMBOLS

The general drawing arrangement shall conform to Attachment C, "Drawing Layout," except for fabrication drawings requiring a parts list/list of material. On the drawings which require the listing of material, the table shall be placed in the upper right hand corner adjacent to the vertical line extended from the title block. Notes shall be placed in the space above the title block limited by the left vertical line of the title block extending to the top border. In a series of related drawings covering a single subject, all general notes and references shall be placed on one drawing near the beginning of the series. Other drawings in the series will bear a typical note: "For General Notes and References, See Drawing No. _____."

9.0 GENERAL DRAFTING PRACTICES

9.1 LETTERING

Letters shall be all uppercase Romans, unless other standard conventions apply (e.g., abbreviation, units). The minimum text height shall not be less than 1/8 inch or 2 millimeters, plotted.

9.2 DIMENSIONING

All dimensional lines shall end with an arrowhead. Do not use a slash or dot for a dimension ending. All dimensions shall be shown in the unit system (either English or metric) selected by the CONTRACTOR. Dual units (both English and metric) may be used when applicable and as directed by the CONTRACTOR. In cases where dual units are required to be shown, the following rules shall apply:

- Metric units are shown first with the English equivalent shown in parentheses
- General note explaining equivalent unit measurements

All linear dimensions on engineering drawings shall be shown in inches or millimeters, except civil/site plans where linear dimensions can be shown in feet or meters. When specifying area, square feet or square meters shall be used. Liquid volumes shall be specified in gallons or liters. All other volumes shall be specified in cubic yards or cubic meters.

9.3 LEADER LINES

Leader lines shall be straight and angled. Drawing leader lines from the beginning or end of a note is preferred; they should be short and cross as few lines as possible.

9.4 SECTIONS, ISOMETRICS, AND DETAILS

Sections shall be cut to show essential details to the best advantage. Preference should be given to sections looking toward the top or left of the sheet. Section and details shall be arranged clearly to show work in relation to plan view column line or coordinate grid orientation. Details shall be identified in numerical sequence. Letters and numbers used in section cuts and detail marks may not be duplicated on the same drawing. Section cuts and detail mark designation shall be in accordance with Attachment C "Drawing Layout." Section cuts and detail marks are available from WCH CAD supervisor and shall be requested prior to project startup.

9.5 NORTH ARROW

Drawings shall be oriented with north at the top of the sheet or to the left of the sheet if top orientation is impractical. On plan and profile sheets, stationing from left to right will govern, regardless of

direction of north. Typical north arrow is available from WCH CAD supervisor and shall be requested prior to project startup.

9.6 REVISION TRIANGLE AND "CLOUD"

Revision triangles shall be placed at the location within the drawing that is receiving the revision status. This triangle shall be approximately 9.5 mm (3/8 in.) plotted, and the appropriate number designation will be placed within. A "cloud" shall cover the area of the revision. As the drawing is updated, the "cloud" and revision triangle for the previous revision shall be removed and new "cloud" and revision triangle will be placed at new revised area with next sequential revision number.

9.7 PLOTTING

The final plot size shall be consistent with standard drawing sheet sizes, (refer to Attachment B). For document retention purposes, every effort shall be made to provide the CONTRACTOR with the sheet sizes, D, E, A1 or A0.

9.8 SCALES

Unless otherwise directed by the person responsible for the technical content of the drawing, the following conventional scales shall be used consistent with the sheet size:

- English: 1:10, 1:20, 1:30, 1:40, 1:50, and 1:60 feet.
- Metric: 1:20, 1:25, 1:50, 1:75, 1:100, and 1:125 meters.

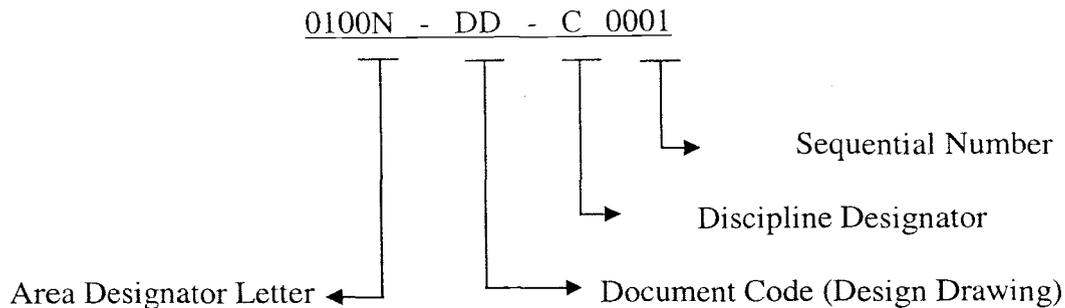
The applicable scales shall be shown graphically (bar scales) on the drawing.

10.0 CADD FILE SUBMITTAL

CAD data set files (.dwg) will be transmitted to the CONTRACTOR at each drawing submittal. CAD files shall be placed on R/W CD labeled clearly to capture contents of the CD.

11.0 DRAWING NUMBERS

Drawing numbers shall be obtained from WCH CAD supervisor. Each drawing shall have a separate number. The request to obtain a block of drawing numbers can be granted, but during close-out of the project, the SUBCONTRACTOR shall provide the CONTRACTOR the unused drawing numbers.

0100N-DD-C0001**Discipline Designator:**

- A = Architectural
- C = Civil/Structural
- D = Systems Engineering
- E = Electrical
- F = Process Engineering
- G = Generic, Site Wide, or Multi-Discipline
- J = Control Systems
- N = Nuclear/Safety Engineering
- V = Environmental
- M = Mechanical
- W = Waste Management
- X = No Discipline Designator

Area Designator Letter:

X = No Area or Building Designator Area or Building Designator Number
 0000 -Generic (Applicable Site Wide)

12.0 FILE NAMING

Each CAD data set file will have a project-specific file name up to eight characters with a three-character extension. The CAD data set file naming should closely follow the drawing numbering system. Drawings shall be numbered in accordance with the below example. The following example depicts a typical drawing number with a CAD drawing file name:

All basemaps shall contain appropriate references. The following reference is typical:

Reference: Hanford Site Drawing, No. H.-3-23571, Rev. 2, Title: "Mechanical Plot Plan," dated 2/9/82. Revised: 8/10/85, Scale: ¼ in. = 1 ft,-0in.

15.0 DRAWING DESIGN CHANGE PROCESS

Design changes to the IFC drawings shall be made following either the CONTRACTOR's or the SUBCONTRACTOR's design change process. The design entity responsible for the original design or a subject matter expert (SME) shall review and approve each design change. Design changes shall be supported by Request for Information (RFI), Supplier Deviation Disposition Request (SDDR), or Design Change Notice (DCN).

A graded approach to design change may be used when addressing a minor change to an IFC drawing during construction. Minor changes may be redlined on an IFC drawing after the change is reviewed with the design entity responsible for the original design or an SME (e.g. for an electrical drawing change, an NEC inspector or other WCH SME for electrical work). A change to an IFC drawing is considered minor if it does not change the intent of the original design and can be clearly shown and described by redlining the drawing.

Redlining an IFC drawing is completed with the following steps:

- Coordinate and obtain approval for desired change from the engineer who originated the drawing or an SME for the affected area of interest
- Using red ink, mark up the drawing to show the change and draw a cloud around the revised portion of the drawing
- Next to the redlined change, the person making the change shall clearly initial, date and note the source for the change (e.g. per discussion with design engineer or SME)

All changes to IFC drawings shall be documented by marking the change directly on the drawing and surrounding it with a cloud. Where the change is difficult to add to the drawing by hand, the affected area shall be clouded and the DCN itself shall be attached to the drawing. All changes, whether made with DCNs or with the redlining process, shall be marked with the name of who made the change to the drawing, the date and the source of the change (e.g. DCN number, per direction of design engineer or SME).

Changes to an initial as-built drawing shall be made only with the CONTRACTOR's design change notice process. Time requirements for incorporation of design changes to IFC, working and initial as-built drawings shall be completed in accordance with the requirements of WCH procedure ENG-1-4.8, Design Change Control, Attachment 4.

16.0 AS-BUILT DRAWINGS.

As-built drawings prepared by the SUBCONTRACTOR during and following the construction period shall include working drawings, initial as-built drawings, and final as-built drawings. As-built drawings for energized utility systems shall be shown in sufficient detail to identify the location of the entire system within the construction area. For buried conduits or pipelines, location information shall

be provided at each major fitting (valves, elbows, tees, etc) or direction change. Buried utilities shall be located with an accuracy of +/- 6 inches by providing on the as-built drawings, at a minimum, horizontal and vertical dimensions and/or coordinates and elevations.

As-Built Drawings shall be submitted in accordance with Exhibit B, "Special Conditions" and Exhibit I, "Subcontractor Submittal Requirements Summary" of the contract.

Working Drawings. During the construction period, SUBCONTRACTOR shall keep a marked up-to-date set of IFC drawings on the jobsite that provides an accurate record of the work installed. The working drawing set shall show any deviations between work as shown in the originally submitted and approved IFC drawings and work as installed. The working drawings shall be maintained throughout the project and shall be available to the CONTRACTOR and OWNER's representatives for inspection at any time. Changes to the IFC and working drawings shall be made in accordance with the section on Drawing Design Change Process contained in this specification.

SUBCONTRACTOR shall use information from the working drawings to prepare initial and final as-built drawings for submittal to the CONTRACTOR.

Initial As-Built Drawings. For new energized utility systems, a set of initial as-built drawings shall be prepared by the SUBCONTRACTOR and submitted to the CONTRACTOR for review and approval. The initial as-built drawings shall be submitted after the final inspection and approval of the completed utility system by the CONTRACTOR. The construction contract identifies the timing for the SUBCONTRACTOR's submittal of the initial as-built drawings. The initial as-built drawings shall incorporate all design changes made to the working drawings during the construction of the energized utility and shall be stamped by the design entity who originated the drawing to reflect that the drawing accurately presents the as-built condition. The SUBCONTRACTOR shall furnish to the CONTRACTOR a complete set of initial as-built drawings of the energized utility systems with INITIAL AS-BUILT clearly printed on each sheet and the associated electronic media version.

The SUBCONTRACTOR shall maintain a copy of the initial as-built drawings with the project working drawings. Any addition or change to an energized utility system, after the system is in service and the initial as-built drawings have been submitted and approved, shall be made in accordance with the section on Drawing Design Change Process in this specification.

Final As-built Drawings. At the end of a project, the SUBCONTRACTOR shall prepare a set of final as-built drawings. The final as-built drawings are based on information maintained by the SUBCONTRACTOR on the working drawings and initial as-built drawings. The final as-built drawings shall show the final configuration of the project and shall include the following information:

- For energized utility systems drawings: the initial as-built drawings for energized systems shall have all outstanding DCN's incorporated and shall depict the final configuration of the system(s). These drawings shall be submitted to the CONTRACTOR as "Final As-Built."
- For all other working drawings:
 - Drawings required to depict the final configuration of the project's site, facilities, structures, and/or systems shall have all outstanding Drawing Design Changes incorporated and be submitted to the CONTRACTOR as "Final As-Built."

- Drawings that are not required to depict the final configuration of the project's site, facilities, structures, and/or systems shall be marked "VOID" and submitted to the CONTRACTOR as "Final As-Built."

The final as-built drawings shall be prepared and submitted by the SUBCONTRACTOR as one of the demobilization deliverables. The final as-built drawings shall be stamped by the design entity who originated the drawing to reflect that the drawings accurately depict the final configuration of the project. The SUBCONTRACTOR shall furnish to the CONTRACTOR a complete set of final as-built drawings with FINAL AS-BUILT clearly printed on each sheet and the associated electronic media version.

ATTACHMENT A

SUBCONTRACTOR

PROJECT DESIGN DRAWING TITLE BLOCK CONFIGURATION

The diagram shows a drawing title block configuration with the following sections and fields:

- Revision Table:** A table with columns for REV. (1), DATE (2), DESCRIPTION (3), and columns for DRAFT BY, DRAFT CHECK, ENG'G CHECK, ENG'G CHECK, SYS. ENGR, and PROJ. ENGR. Callouts 4, 5, 6, 7, 8, and 9 point to these respective columns.
- Scale:** SCALE: X (10)
- Project Information:** U.S. DEPARTMENT OF ENERGY, DOE RICHLAND OPERATIONS OFFICE, RIVER CORRIDOR CLOSURE CONTRACT.
- Subcontractor Information:** WASHINGTON CLOSURE HANFORD LLC., RICHLAND, WASHINGTON (11). Callout 11 points to this section.
- Project Location:** PROJECT LOCATION (12), ACTION, DRAWING TYPE (14).
- Job and Contract Numbers:** WCH JOB NO. (13), DOE CONTRACT NO., CADD FILENAME (15).
- Task and Drawing Info:** TASK (17), DRAWING NO. (16), REV. NO. (16).
- Record Information:** RECORD INFORMATION table with columns for RECORD NO. (19), BLDG. NO. (20), INDEX NO. (21), and a logo for Washington Closure Hanford.

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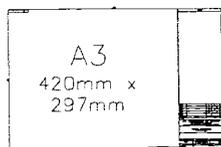
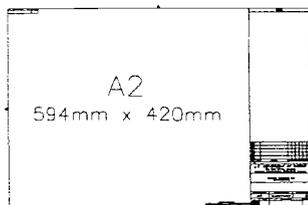
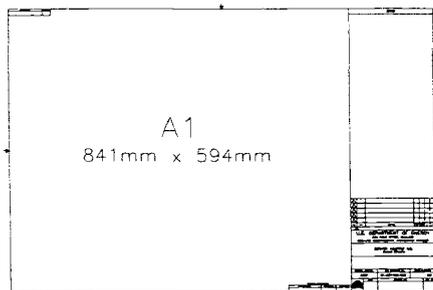
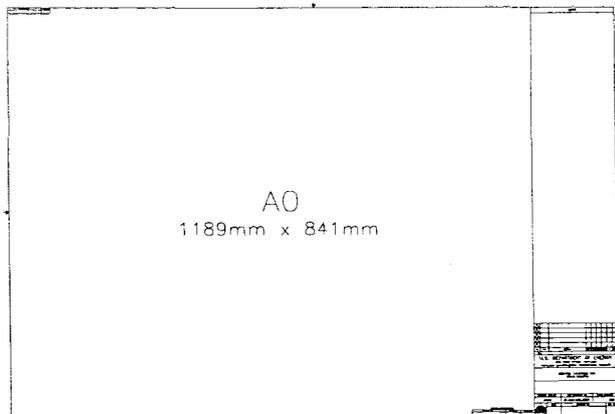
SCALE: X		
U.S. DEPARTMENT OF ENERGY DOE RICHLAND OPERATIONS OFFICE RIVER CORRIDOR CLOSURE CONTRACT		
WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON		
PROJECT LOCATION ACTION DRAWING TYPE		
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-ACC06-05RL-14655	XXXXXXXX.DWG
TASK	DRAWING NO.	REV. NO.
X	XXXXX-DD-XXXXX	X

RECORD INFORMATION		
RECORD NO.	BLDG. NO.	INDEX NO.
H-X-XXXXXX	XXX	XXX

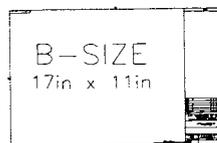
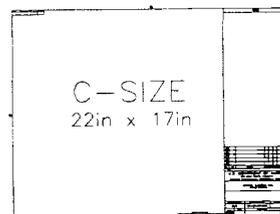
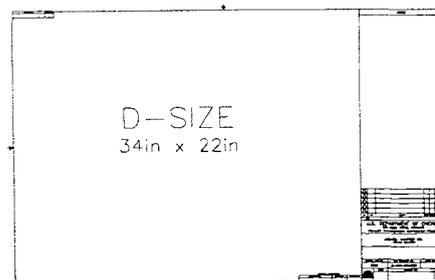
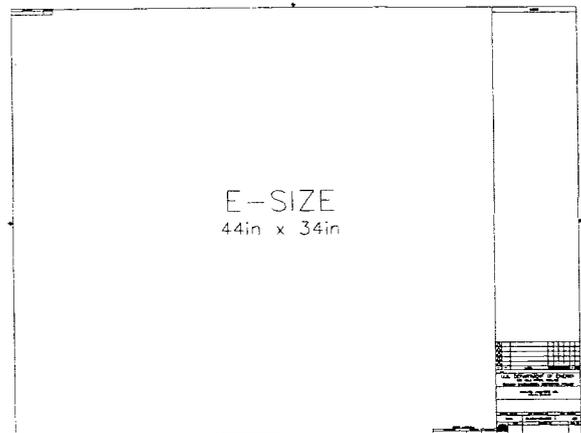
ATTACHMENT B

STANDARD DRAWING SHEET SIZES

METRIC

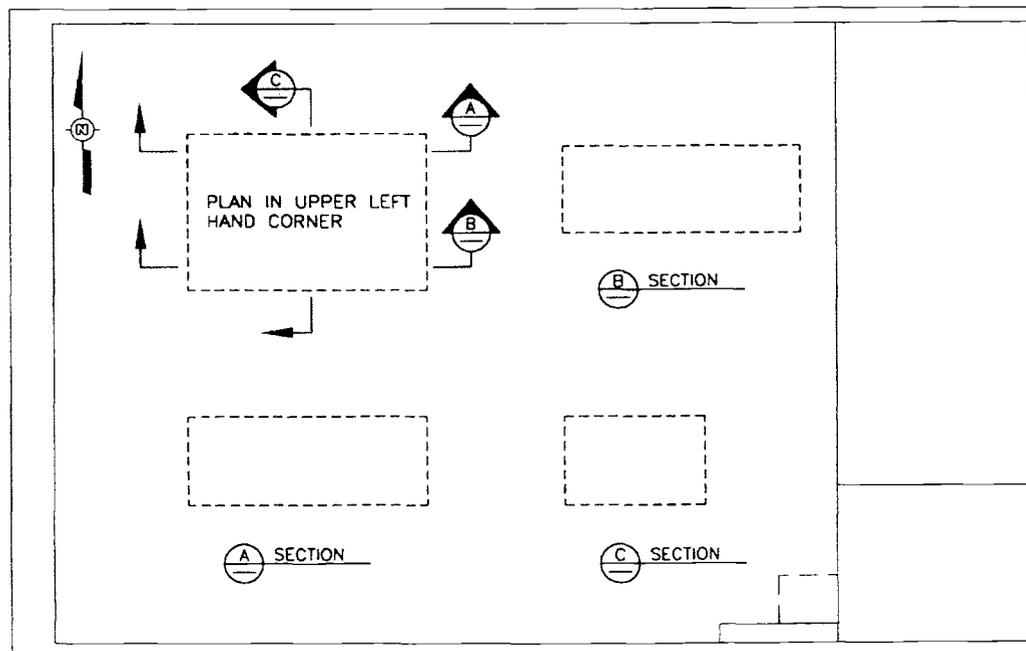
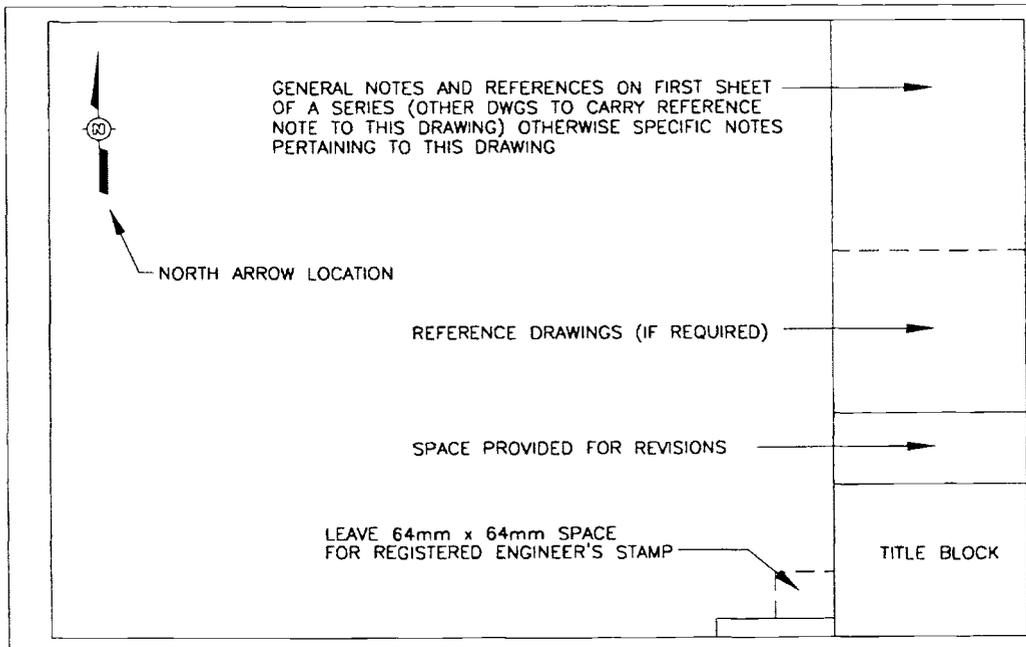


ENGLISH



ATTACHMENT C

DRAWING LAYOUT



CADP02-F3.DWG

EXHIBIT "F"
DRAWING LIST

**WASHINGTON CLOSURE HANFORD, LLC
RIVER CORRIDOR CLOSURE PROJECT**

ERDF SUPER CELLS 9 & 10 CQA

Subcontract Number: S013213A00

EXHIBIT "F"
DRAWINGS
WASHINGTON CLOSURE HANFORD, LLC
ERDF SUPER CELLS 9 & 10 CONSTRUCTION

	<u>Drawing No.</u>	<u>Rev. No.</u>	<u>Date</u>	<u>Title</u>
1	0600X-DD-G0043	0	11/13/2009	Title, Location & Hanford Area Maps
2	0600X-DD-G0044	0	11/13/2009	Drawing List
3	0600X-DD-G0045	0	11/13/2009	Symbols
4	0600X-DD-G0046	0	11/13/2009	Abbreviations
5	0600X-DD-G0047	0	11/13/2009	Coordinate Table
6	0600X-DD-C0451	0	11/13/2009	Overall Site Plan
7	0600X-DD-C0452	0	11/13/2009	Subgrade Survey Control - Cell 9
8	0600X-DD-C0453	0	11/13/2009	Subgrade Survey Control - Cell 10
9	0600X-DD-C0454	0	11/13/2009	Sump Layout Plan - Cell 9
10	0600X-DD-C0455	0	11/13/2009	Sump Layout Plan - Cell 10
11	0600X-DD-C0456	0	11/13/2009	General Cross Sections
12	0600X-DD-C0457	0	11/13/2009	Civil Sections
13	0600X-DD-C0458	0	11/13/2009	Liner System Details - 1
14	0600X-DD-C0459	0	11/13/2009	Liner System Details - 2
15	0600X-DD-C0460	0	11/13/2009	Sump Details - 1
16	0600X-DD-C0461	0	11/13/2009	Sump Details - 2
17	0600X-DD-C0462	0	11/13/2009	Liner Termination Details - 1
18	0600X-DD-C0463	0	11/13/2009	Liner Termination Details - 2
19	0600X-DD-C0464	0	11/13/2009	Crest Pad Plan and Elevation
20	0600X-DD-C0465	0	11/13/2009	Leachate Transmission Pipeline & Tank
21	0600X-DD-C0466	0	11/13/2009	Yard Piping Plan - Cells 9 & 10
22	0600X-DD-C0467	0	11/13/2009	Yard Piping Plan - Transmission Pipeline
23	0600X-DD-C0468	0	11/13/2009	Yard Piping Plan - Leachate Storage Tank Area
24	0600X-DD-C0469	0	11/13/2009	Leachate Storage Tank Details
25	0600X-DD-C0470	0	11/13/2009	Fence Details

26	0600X-DD-C0471	0	11/13/2009	Yard Piping Waterline Extension Details
27	0600X-DD-C0475	0	11/13/2009	Crest Pad Bldg Structural Plans and Sections
28	0600X-DD-C0476	0	11/13/2009	Structural Details - 1
29	0600X-DD-C0477	0	11/13/2009	Structural Details - 2
30	0600X-DD-A0018	0	11/13/2009	Crest Pad Bldg - Plans and Elevations
31	0600X-DD-A0019	0	11/13/2009	Architectural Details -1
32	0600X-DD-A0020	0	11/13/2009	Finish Details
33	0600X-DD-M0053	0	11/13/2009	Mechanical Schedules -1
34	0600X-DD-M0054	0	11/13/2009	Mechanical Details
35	0600X-DD-M0055	0	11/13/2009	Crest Pad Details - 1
36	0600X-DD-M0056	0	11/13/2009	Crest Pad Details - 2
37	0600X-DD-M0057	0	11/13/2009	Manhole Details - 1
38	0600X-DD-M0058	0	11/13/2009	Manhole Details - 2
39	0600X-DD-M0059	0	11/13/2009	Manhole Details - 3
40	0600X-DD-E0216	0	11/13/2009	Electrical Symbols
41	0600X-DD-E0217	0	11/13/2009	Electrical Abbreviations and General Notes
42	0600X-DD-E0218	0	11/13/2009	Electrical Details - 1
43	0600X-DD-E0219	0	11/13/2009	Electrical Details - 2
44	0600X-DD-E0220	0	11/13/2009	Electrical Cable and Raceway Schedule
45	0600X-DD-E0221	0	11/13/2009	Electrical Site Plan - Cell 9
46	0600X-DD-E0222	0	11/13/2009	Electrical Site Plan - Cell 10
47	0600X-DD-E0223	0	11/13/2009	Electrical One-Line Switchgear
48	0600X-DD-E0224	0	11/13/2009	MCC One-Line Diagram
49	0600X-DD-E0225	0	11/13/2009	MCC Details
50	0600X-DD-E0226	0	11/13/2009	Electrical Schedules
51	0600X-DD-E0227	0	11/13/2009	Control Schematics
52	0600X-DD-E0228	0	11/13/2009	Crest Pad Electrical Power Plan
53	0600X-DD-E0229	0	11/13/2009	Crest Pad Electrical Lighting Plan
54	0600X-DD-E0230	0	11/13/2009	Control Panel Arrangement Details
55	0600X-DD-E0231	0	11/13/2009	Elementary Wiring Diagram - 1

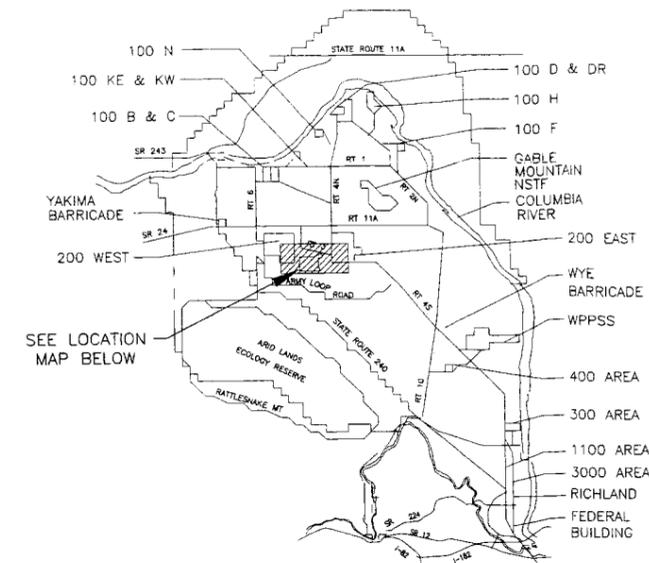
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57	0600X-DD-E0233	0	11/13/2009	Telemetry Panel Layout
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DRAWING NO. 0600X-DD-G0043
REV. NO. 0

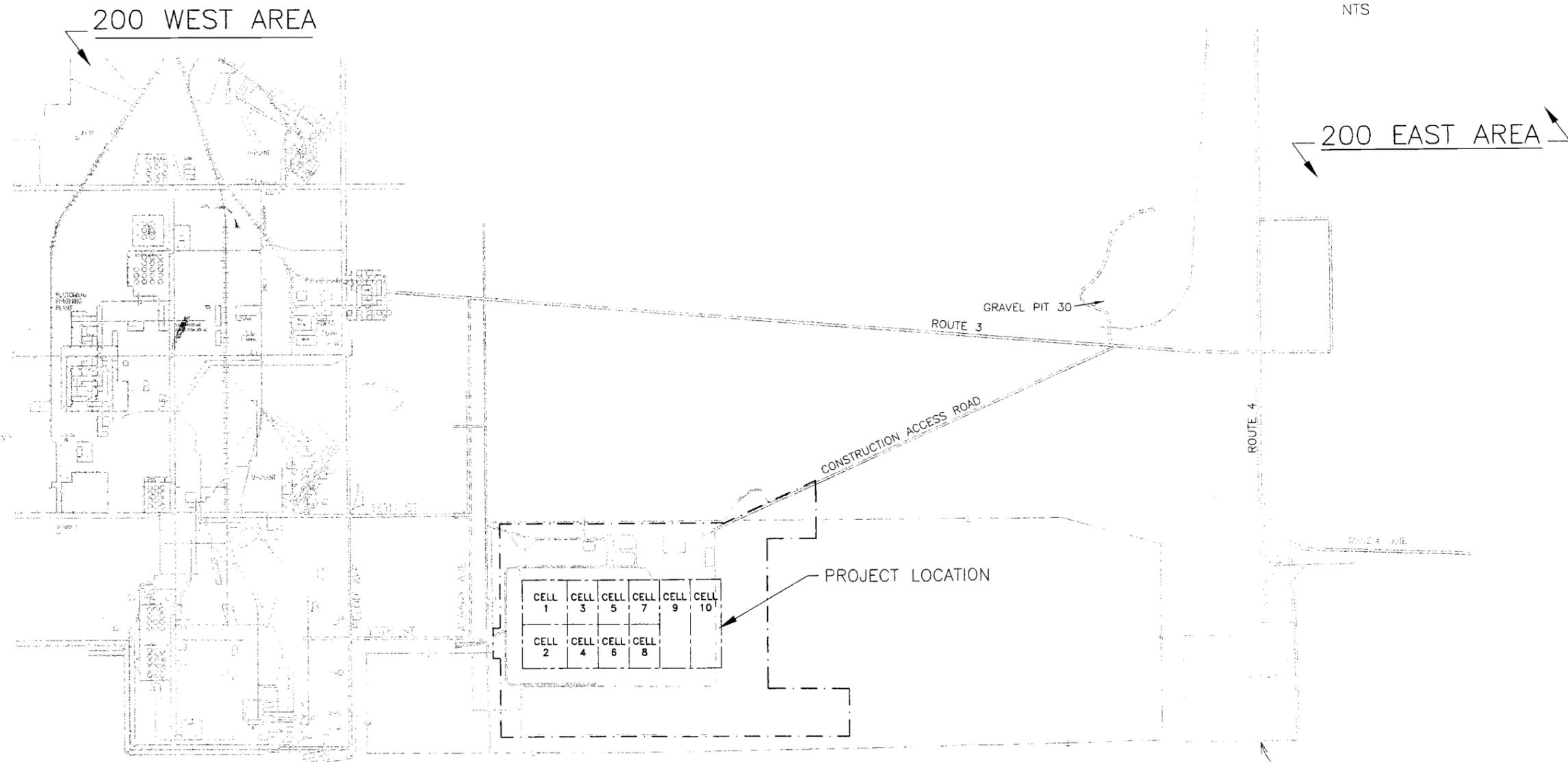
PROJECT TITLE:
**ENVIRONMENTAL RESTORATION
 DISPOSAL FACILITY (ERDF)
 CELLS 9 AND 10 CONSTRUCTION
 DRAWINGS**

FOR:
WASHINGTON CLOSURE HANFORD, LLC

BY:
WEAVER BOOS CONSULTANTS, LLC



**HANFORD AREA MAP
 NTS**



**LOCATION MAP
 NTS**

NOTES

THIS PORTION OF THE TECHNICAL SUBMISSION DESCRIBED BELOW HAS BEEN PREPARED UNDER THE DIRECT SUPERVISION AND RESPONSIBLE CHARGE OF THE UNDERSIGNED.

NAME JOHN C. BRIEST

DISCIPLINE PROFESSIONAL ENGINEER

SHEETS COVERED BY THIS SEAL G0043-CO471, M0053-M0059



THIS PORTION OF THE TECHNICAL SUBMISSION DESCRIBED BELOW HAS BEEN PREPARED UNDER THE DIRECT SUPERVISION AND RESPONSIBLE CHARGE OF THE UNDERSIGNED.

NAME RAYMOND E. MERRIMAN

DISCIPLINE PROFESSIONAL ENGINEER

SHEETS COVERED BY THIS SEAL E0216-E0234



THIS PORTION OF THE TECHNICAL SUBMISSION DESCRIBED BELOW HAS BEEN PREPARED UNDER THE DIRECT SUPERVISION AND RESPONSIBLE CHARGE OF THE UNDERSIGNED.

NAME MARK H. FOSTER

DISCIPLINE PROFESSIONAL ENGINEER

SHEETS COVERED BY THIS SEAL C0475-CO477, A0018-A0020



WASHINGTON CLOSURE HANFORD		JOB NO. 14655
SUBMITTER'S/CONTRACTOR DOCUMENT STATUS SHEET		
<input type="checkbox"/> 1. All work completed	<input type="checkbox"/> 2. Review and issuance. Work may proceed after re-submission.	
<input type="checkbox"/> 3. Review and issuance. Work may proceed after re-submission. Subject to re-issuance of individual comments.	<input type="checkbox"/> 4. Review and issuance. Work may proceed.	
<input type="checkbox"/> 5. Review and issuance. Work may proceed.	<input type="checkbox"/> 6. Review and issuance. Work may proceed.	
Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the submittal contractor and does not relieve the submittal contractor from full compliance with contractual obligations or release any "holds" placed on the contract.		
DATE	BY	REVISION
11-23-2009	W.A. Foster	
DOCUMENT NUMBER		DATE
S06X5244000N03.05-014-020		11-23-2009
SUBMITTER'S/CONTRACTOR		

RECEIVED
 NOV 21 2009
 WCH - DOCUMENT CONTROL

DOCUMENT CONTROL 11/23/09

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
	11/13/09	ISSUED FOR AWARD						

U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
 CELLS 9 - 10
 TITLE, LOCATION & HANFORD AREA MAPS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XD0043.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-G0043	0

US ECOLOGY

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16337 SHT01	600G	0100



DRAWING LIST

GENERAL

DRAWING NUMBER	DRAWING TITLE
0600X-DD-G0043	TITLE, LOCATION & HANFORD AREA MAPS
0600X-DD-G0044	DRAWING LIST
0600X-DD-G0045	SYMBOLS
0600X-DD-G0046	ABBREVIATIONS
0600X-DD-G0047	COORDINATE TABLE
0600X-DD-G0048	RESERVED FOR FUTURE USE -- (NOT USED)

CIVIL

0600X-DD-C0451	OVERALL SITE PLAN
0600X-DD-C0452	SUBGRADE SURVEY CONTROL - CELL 9
0600X-DD-C0453	SUBGRADE SURVEY CONTROL - CELL 10
0600X-DD-C0454	SUMP LAYOUT PLAN - CELL 9
0600X-DD-C0455	SUMP LAYOUT PLAN - CELL 10
0600X-DD-C0456	GENERAL CROSS SECTIONS
0600X-DD-C0457	CIVIL SECTIONS
0600X-DD-C0458	LINER SYSTEM DETAILS - 1
0600X-DD-C0459	LINER SYSTEM DETAILS - 2
0600X-DD-C0460	SUMP DETAILS - 1
0600X-DD-C0461	SUMP DETAILS - 2
0600X-DD-C0462	LINER TERMINATION DETAILS - 1
0600X-DD-C0463	LINER TERMINATION DETAILS - 2
0600X-DD-C0464	CREST PAD PLAN AND ELEVATION
0600X-DD-C0465	LEACHATE TRANSMISSION PIPELINE & TANK
0600X-DD-C0466	YARD PIPING PLAN - CELLS 9 & 10
0600X-DD-C0467	YARD PIPING PLAN - TRANSMISSION PIPELINE
0600X-DD-C0468	YARD PIPING PLAN - LEACHATE STORAGE TANK AREA
0600X-DD-C0469	LEACHATE STORAGE TANK DETAILS
0600X-DD-C0470	FENCE DETAILS
0600X-DD-C0471	YARD PIPING WATERLINE EXTENSION DETAILS
0600X-DD-C0472	RESERVED FOR FUTURE USE -- (NOT USED)
0600X-DD-C0473	RESERVED FOR FUTURE USE -- (NOT USED)
0600X-DD-C0474	RESERVED FOR FUTURE USE -- (NOT USED)

STRUCTURAL CIVIL

DRAWING NUMBER	DRAWING TITLE
0600X-DD-C0475	CREST PAD BLDG STRUCTURAL PLANS AND SECTIONS
0600X-DD-C0476	STRUCTURAL DETAILS - 1
0600X-DD-C0477	STRUCTURAL DETAILS - 2
0600X-DD-C0478	RESERVED FOR FUTURE USE -- (NOT USED)

ARCHITECTURAL

0600X-DD-A0018	CREST PAD BLDG - PLANS AND ELEVATIONS
0600X-DD-A0019	ARCHITECTURAL DETAILS - 1
0600X-DD-A0020	FINISH SCHEDULES
0600X-DD-A0021	RESERVED FOR FUTURE USE -- (NOT USED)
0600X-DD-A0022	RESERVED FOR FUTURE USE -- (NOT USED)

MECHANICAL

0600X-DD-M0053	MECHANICAL SCHEDULES
0600X-DD-M0054	MECHANICAL DETAILS
0600X-DD-M0055	CREST PAD DETAILS - 1
0600X-DD-M0056	CREST PAD DETAILS - 2
0600X-DD-M0057	MANHOLE DETAILS - 1
0600X-DD-M0058	MANHOLE DETAILS - 2
0600X-DD-M0059	MANHOLE DETAILS - 3

ELECTRICAL

0600X-DD-E0216	ELECTRICAL SYMBOLS
0600X-DD-E0217	ELECTRICAL ABBREVIATIONS AND GENERAL NOTES
0600X-DD-E0218	ELECTRICAL DETAILS - 1
0600X-DD-E0219	ELECTRICAL DETAILS - 2
0600X-DD-E0220	ELECTRICAL CABLE AND RACEWAY SCHEDULE
0600X-DD-E0221	ELECTRICAL SITE PLAN - CELL 9
0600X-DD-E0222	ELECTRICAL SITE PLAN - CELL 10
0600X-DD-E0223	ELECTRICAL ONE-LINE SWITCHGEAR
0600X-DD-E0224	MCC ONE-LINE DIAGRAMS
0600X-DD-E0225	MCC DETAILS
0600X-DD-E0226	ELECTRICAL SCHEDULES
0600X-DD-E0227	CONTROL SCHEMATICS
0600X-DD-E0228	CREST PAD ELECTRICAL POWER PLAN
0600X-DD-E0229	CREST PAD ELECTRICAL LIGHTING PLAN
0600X-DD-E0230	CONTROL PANEL ARRANGEMENT DETAILS
0600X-DD-E0231	ELEMENTARY WIRING DIAGRAM - 1
0600X-DD-E0232	ELEMENTARY WIRING DIAGRAM - 2
0600X-DD-E0233	TELEMETRY PANEL LAYOUT
0600X-DD-E0234	TELEMETRY PANEL ELEMENTARY DIAGRAM

NOTES

THIS PORTION OF THE TECHNICAL SUBMISSION DESCRIBED BELOW HAS BEEN PREPARED UNDER THE DIRECT SUPERVISION AND RESPONSIBLE CHARGE OF THE UNDERSIGNED.

NAME JOHN C. BRIEST

DISCIPLINE PROFESSIONAL ENGINEER

SHEETS COVERED BY THIS SEAL G0043-C0471, M0053-M0059



THIS PORTION OF THE TECHNICAL SUBMISSION DESCRIBED BELOW HAS BEEN PREPARED UNDER THE DIRECT SUPERVISION AND RESPONSIBLE CHARGE OF THE UNDERSIGNED.

NAME RAYMOND E. MERRIMAN

DISCIPLINE PROFESSIONAL ENGINEER

SHEETS COVERED BY THIS SEAL F0216-F0234



THIS PORTION OF THE TECHNICAL SUBMISSION DESCRIBED BELOW HAS BEEN PREPARED UNDER THE DIRECT SUPERVISION AND RESPONSIBLE CHARGE OF THE UNDERSIGNED.

NAME MARK H. FOSTER

DISCIPLINE PROFESSIONAL ENGINEER

SHEETS COVERED BY THIS SEAL C0475-C0477, A0018-A0020



WASHINGTON CLOSURE HANFORD		JOB NO. 14655
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP		
<input type="checkbox"/>	1. I took this process.	
<input type="checkbox"/>	2. Review and rework. Work may proceed per re-submission.	
<input type="checkbox"/>	3. Review and rework. Work may proceed per re-submission subject to revision of original contract.	
<input type="checkbox"/>	4. Review and rework. Work may not proceed.	
<input type="checkbox"/>	5. Permission to proceed for closure.	

Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or violate any "hold" placed on the contract.

REV.	DATE	BY	DESCRIPTION
1	11-23-2009	W.A. Foster	

DOCUMENT ID NUMBER: 506X524A000083-09-014-021

RECEIVED
NOV 21 2009
WCH - DOCUMENT CONTROL

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
1	11/13/09	ISSUED FOR AWARD						

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS, LLC DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
DRAWING LIST

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDG0044.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-G0044	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16338 SHT01	600G	0000

DRAWING NO. 0600X-DD-G0045
REV. NO. 0

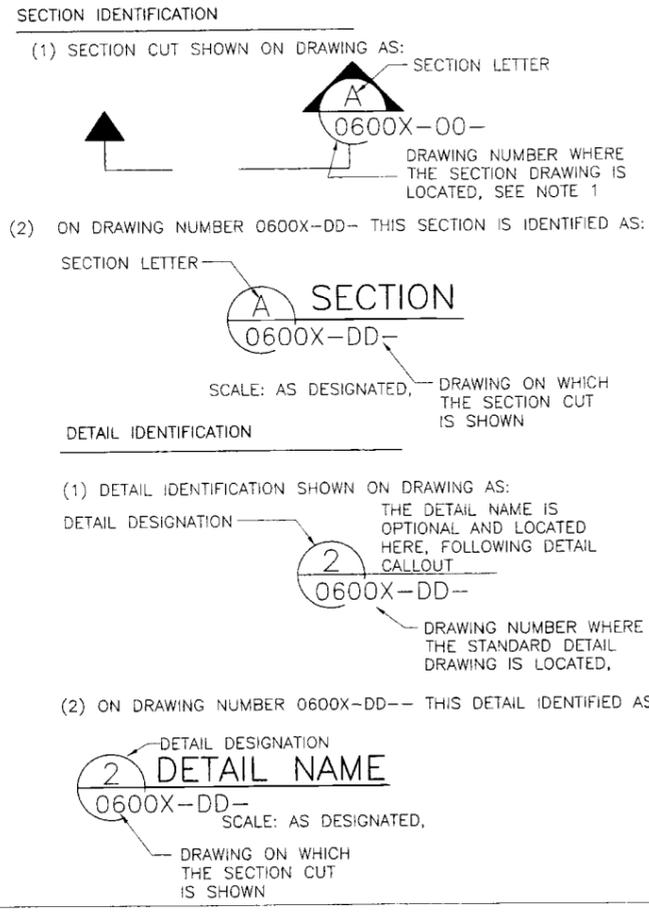
- N400000 HANFORD COORDINATE GRID LINE
- EXISTING SURFACE FEATURE OR PIPE
- EXISTING UNDERGROUND PIPE
- NEW PIPELINE (CIVIL SHEETS) 10" DIA OR SMALLER
- CELL BOUNDARY
- X-X NEW FENCE
- EXISTING FENCE
- EXIST. RAILING
- NEW RAILING
- CENTERLINE
- PROPERTY LINE
- 123 CONTOUR LINE, FINISHED GRADE
- 123.20 CONTOUR LINE, EXISTING GRADE
- 123.20 FINISHED ELEVATION
- 123.20 EXISTING ELEVATION
- /// NEW A.C. PAVING
- /// EXISTING A.C. PAVING
- NEW RAILROAD
- EXISTING RAILROAD
- ▲ SLOPE INDICATION
- LIMITS OF CONSTRUCTION
- FUTURE STRUCTURE OR FACILITY
- EXISTING STRUCTURE OR FACILITY
- EXISTING UNDERGROUND STRUCTURE OR FACILITY
- POTENTIAL FUTURE STRUCTURE OR FACILITY
- GRAVEL
- CONCRETE
- EARTH
- SAND
- GRATING
- LOW PERMEABILITY SOIL LINER
- ⊗ GATE VALVE, BURIED WITH VALVE BOX
- ⊙ BUTTERFLY VALVE, BURIED VALVE BOX WITH
- ⊙ ECCENTRIC PLUG VALVE, BURIED WITH VALVE BOX
- FH FIRE HYDRANT
- MH MANHOLE
- PCOTG PRESSURE CLEANOUT TO GRADE
- COTG CLEANOUT TO GRADE
- CB CATCH BASIN
- ← BULK WATER STATION
- BOLLARD
- SOIL TEST PIT
- SURVEY MONUMENTS

- ▲ SURVEY CONTROL POINT
- ⊕ EXISTING WELL
- ⊞ FUTURE WELL
- SOIL BORING LOCATION
- 3400 COORDINATE POINT
- ← DOWN GUY
- TELEPHONE/POWER POLE
- ◆ CHANGE IN PIPING MATERIAL
- ∅ ROUND OR DIAMETER
- SQUARE
- @ AT
- ∟ ANGLE
- 12" RW (24) PIPE CALLOUT (DIA, FLUID ABBR, MATERIAL GROUP NO.)
- ME-2 EQUIPMENT NUMBER (SEE EQUIPMENT SCHEDULE)
- NIC EQUIPMENT, ITEMS OR DETAILS NOT PERTAINING TO THIS CONTRACT OR PROJECT ARE SHOWN THUS WITH THE NIC = NOT IN CONTRACT
- GATE VALVE
- BUTTERFLY VALVE
- ECCENTRIC PLUG VALVE
- GLOBE VALVE
- BALL VALVE
- DIAPHRAGM VALVE
- CHECK VALVE
- PRESSURE REGULATING VALVE
- BACK-PRESSURE VALVE
- FLOAT OPERATED VALVE
- NEEDLE VALVE
- PRESSURE RELIEF VALVE
- M P MOTOR OPERATOR FOR VALVES (M = ELECTRIC, P = PNEUMATIC)
- S SOLENOID VALVE
- H/B HOSE BIBB (H/B)
- B BUBBLER LEVEL CONTROL
- CENTRIFUGAL OR TURBINE PUMP OR FAN
- CHEMICAL FEED PUMP
- PROGRESSING CAVITY, POSITIVE DISPLACEMENT PUMP
- BLOWER OR COMPRESSOR
- INJECTOR OR EDUCTOR

- AIR VACUUM AND AIR RELEASE ASSEMBLY
- THERMOMETER
- PIPE ANCHOR
- STOP GATE
- SLIDE GATE
- SLUICE GATE
- INLINE STATIC MIXER
- HUB DRAIN
- FLOOR DRAIN
- DRAIN
- DRAIN TRAP
- CUT PIPE
- FEXTO FIRE EXTINGUISHER
- PRESSURE GAUGE
- PRESSURE GAUGE WITH DIAPHRAGM SEAL
- PRESSURE SWITCH
- PRESSURE SWITCH WITH DIAPHRAGM SEAL
- FLANGED FITTING
- WELDED FITTING
- MECHANICAL-TYPE FITTING (GROOVED)
- SCREWED, SOCKET-WELD, BELL AND SPIGOT OR HUBLESS FITTING
- SLEEVE-TYPE COUPLING
- FLANGED ADAPTER COUPLING
- FLANGED ADAPTER - SET SCREW TYPE
- EXPANSION JOINT
- MECHANICAL TYPE COUPLING
- FLEXIBLE COUPLING
- UNION
- QUICK DISCONNECT COUPLER
- CAPPED END OR PLUGGED END
- BLIND FLANGE
- REDUCER OR EXPANDER
- STRAINER
- M M MAGNETIC METER
- D M DENSITY METER
- ORIFICE PLATE AND FLANGES
- ROTAMETER

- ✕ PIPE SUPPORT (IN PLAN ONLY)
- MALE FIRE HOSE CONNECTION WITH CAP

SECTION AND DETAIL IDENTIFICATION



NOTES

1. IF PLAN AND SECTION (OR DETAIL CALL-OUT AND DETAIL) ARE SHOWN ON SAME DRAWING, DRAWING NUMBER IS REPLACED BY A HORIZONTAL LINE.
2. SOME SYMBOLS SHOWN ON THIS DRAWING MAY NOT BE USED ON OTHER DRAWINGS.
3. ELECTRICAL SYMBOLS SHOWN ON DRAWING 0600X-DD-E0216.

WASHINGTON CLOSURE HANFORD JOB NO 14655
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed
2. Review and re-submit. Work may proceed prior to re-submission.
3. Review and re-submit. Work may proceed prior to re-submission subject to revision of indicated comments.
4. Review and re-submit. Work may not proceed.
5. Permission to proceed not required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contractual obligations to release any "hold" placed on the contract.

NO.	DATE	BY	DESCRIPTION
1	11-23-2009	W.A. Falgout	ISSUED FOR AWARD

DOCUMENT NUMBER: 0600X-DD-G0045
SUBMITTAL

RECEIVED
NOV 21 2009
WCH - DOCUMENT CONTROL



DOCUMENT CONTROL De. 11/24/09

REV.	DATE	DESCRIPTION	DRAWN BY	DRY/CHK	ORIG/ENGR	ENG'R CHK	EYE ENGR	PROJ ENGR
1	11/23/09	ISSUED FOR AWARD	W	J	SC	W	N/A	PD

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
SYMBOLS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDG0045.DWG

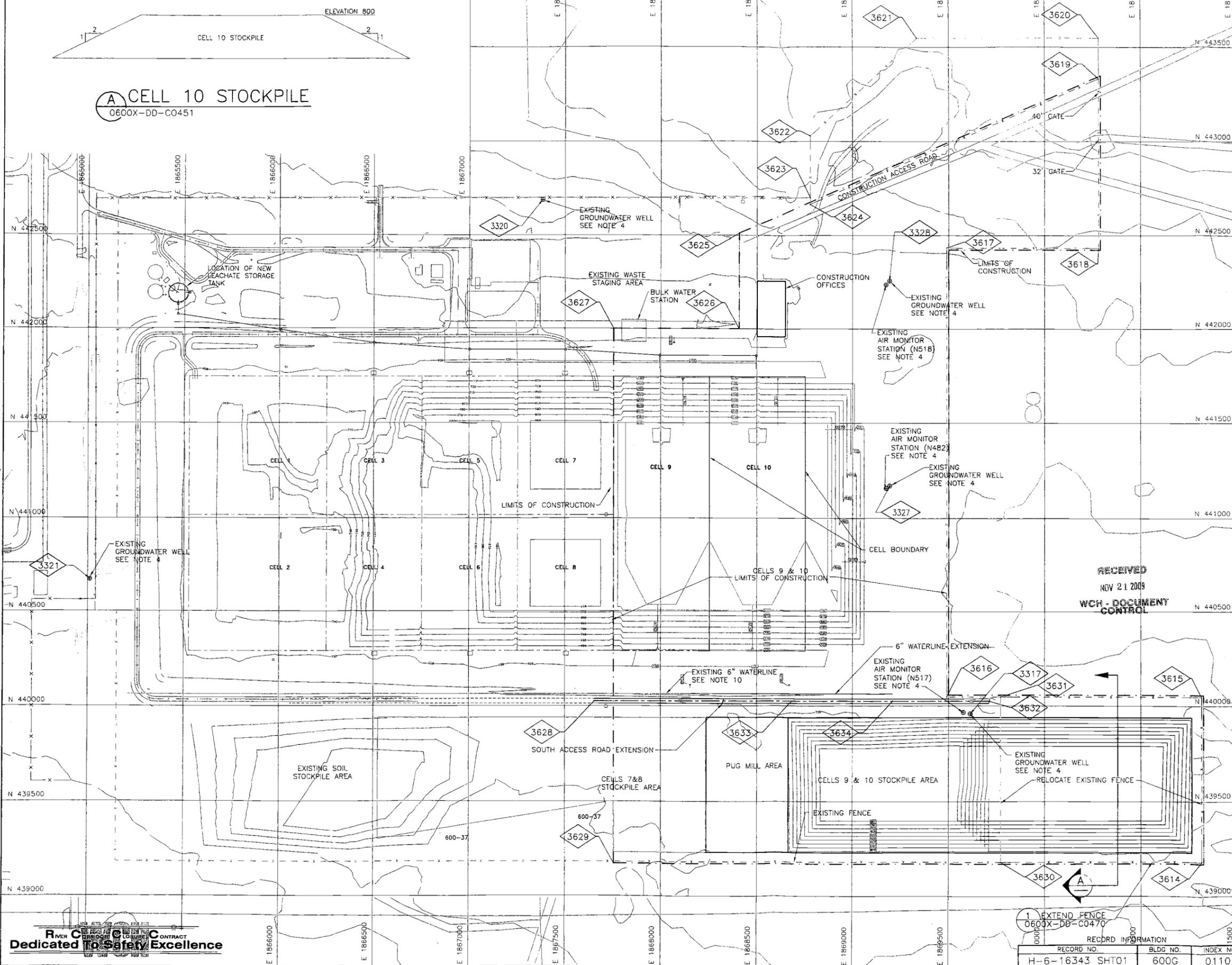
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-G0045	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16339 SHT01	600G	0000



DRAWING NO. 0600X-DD-C0451
REV. NO. 0



NOTES

- WORK AREAS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE CLEARED AS DIRECTED BY THE CONTRACTOR, UNLESS OTHERWISE NOTED. OBTAIN CONTRACTOR APPROVAL PRIOR TO CLEARING AREAS.
- PROTECT AND MAINTAIN EXISTING FENCE AND GATE AT ALL TIMES. WHEN THE ERDF PERIMETER FENCE IS NOT CONTINUOUS AND SOUND, SUBCONTRACTOR SHALL PROVIDE AND MAINTAIN MANNED SECURITY. ONE SECURITY OFFICER SHALL BE PROVIDED AT EACH UNSECURED LOCATION AND FOR EVERY 328 FT OF UNSECURED FENCE LINE.
- SURVEY DATUM:
VERTICAL NAVD 88
HORIZONTAL NAD 83 (91)
- SUBCONTRACTOR SHALL PROTECT AIR MONITORING STATIONS AND GROUNDWATER WELLS
- SEE DWG 0600X-DD-G0047 FOR COORDINATE INFORMATION
- EXACT STOCKPILE BOUNDARIES VARY DUE TO ERDF OPERATION. A GENERAL REPRESENTATION IS SHOWN.
- THE LIMITS OF CONSTRUCTION INDICATE THE AREA WITHIN WHICH THE SUBCONTRACTOR HAS FREE ACCESS. IN SOME CASES, THE SUBCONTRACTOR MAY BE REQUIRED TO PERFORM WORK OUTSIDE THE LIMITS SHOWN (e.g. PULLING WIRE THROUGH EXISTING PULL BOXES AND TIE NEW WORK INTO EXISTING, INSTALLING NEW LEACHATE F.M. AND TANK.) IN THESE INSTANCES THE SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR 48 HOURS IN ADVANCE AND SHALL MINIMIZE THE TIME REQUIRED TO PERFORM THE WORK.
- TOPOGRAPHY IN THE VICINITY OF THE PROJECT IS FROM FIELD SURVEY BY ROGERS SURVEYING INC., JULY 2006.
- CONSTRUCTION ACCESS GATE AND ROAD MAY BE USED BY OTHERS.
- SUBCONTRACTOR MAY CONNECT TO EXISTING WATER LINE. SUBCONTRACTOR MAY PROVIDE AND INSTALL PIPELINE TO SUPPORT SUBCONTRACTOR'S WORK. EXISTING WATERLINE ASBUILTS SHOWN ON DRAWING NOS. 0600X-DD-C0342, C0343, AND C0507.
- GEOSYNTHETICS STORAGE AREA SHALL BE APPROVED BY THE CONTRACTOR WITHIN THE LIMITS OF CONSTRUCTION.

DOCUMENT CONTROL *As 11/24/09*



RECEIVED
NOV 21 2009
WCH - DOCUMENT CONTROL

NO.	DATE	DESCRIPTION	BY	CHKD
1	11-23-2009	ISSUED FOR AWARD	W.A. Tolson	SM

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENGR/ENGR	SYS ENGR	PROD ENGR
1	11/13/09	ISSUED FOR AWARD	W.A. Tolson	SM	N/A		

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

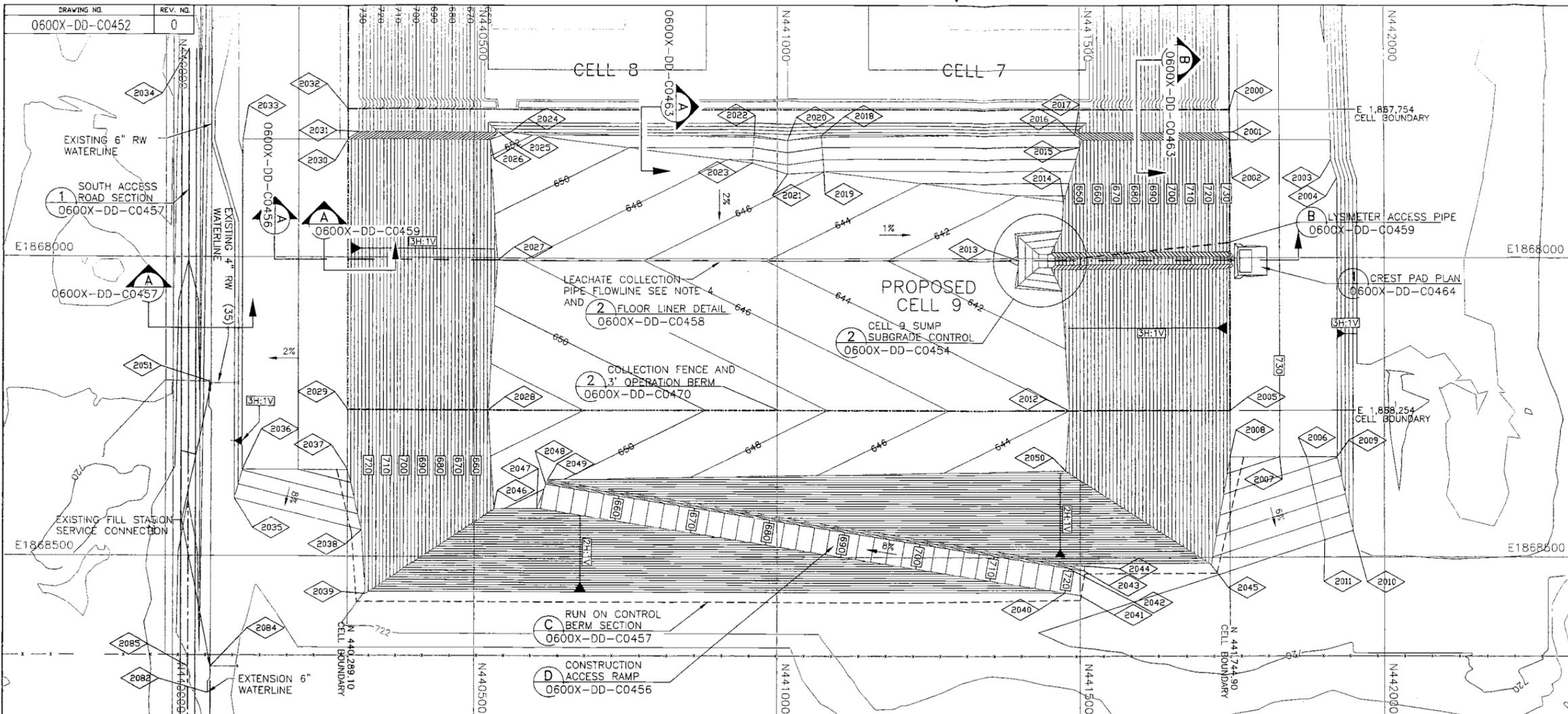
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
OVERALL SITE PLAN

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDC0451.DWG
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TASK ERDF	DRAWING NO. 0600X-DD-C0451	REV. NO. 0
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RECORD INFORMATION	RECORD NO. H-6-16343 SHT01	BLDG NO. 600G	INDEX NO. 0110
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RIVER CORRIDOR CLOSURE CONTRACT
Dedicated to Safety Excellence



NOTES

- GRADING TOLERANCES SHOWN ON DWG. NO. 0600-DD-C0458
- EXISTING CONTOURS FROM FIELD SURVEY PREPARED BY ROGERS SURVEYING, INC., DATED JULY, 2006. TOPOGRAPHY DOES NOT REFLECT CHANGES FROM OPERATIONS SINCE JULY 2006. SUBCONTRACTOR SHALL CONSTRUCT FACILITIES TO THE FINISHED ELEVATIONS SHOWN.
- SURVEY DATUM:
VERTICAL NAVD: 88
HORIZONTAL NAD: 83 (91)
- THE LEACHATE COLLECTION PIPE ALIGNMENT SHALL BE INSTALLED TO A ± 6-INCH TOLERANCE TO THE LEACHATE COLLECTION PIPE FLOW LINE.

RECEIVED NOV 21 2009 DOCUMENT CONTROL

WCH - DOCUMENT CONTROL

WASHINGTON CLOSURE HANFORD JOB NO. 14655
SUBGRADE/SURVEY CONTROL DOCUMENT STATUS SHEET

1. Check for accuracy
2. Review and rework. Work may proceed prior to resubmission
3. Review and rework. Work may proceed prior to resubmission subject to resolution of indicated comments.
4. Review and rework. Work may not proceed.
5. Permission to proceed not required.

Permission to proceed does not constitute acceptance or approval of design, details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not release the supplier/subcontractor from full compliance with contract obligations or release any "holds" placed on the contract.

JOHN CARL BRESNA
TYPE OF WASHINGTON STATE
REGISTERED PROFESSIONAL ENGINEER
42158
11/23/09

SUBGRADE DESIGN CONTROL POINTS COORDINATES (WASHINGTON STATE PLANE, FT)

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
2000	441744.90	1867754.00	731.64	CELL BOUNDARY FOR CELLS 7 & 8 TO 9
2001*	441727.00	1867792.00	732.69	SLOPE CREST TIE IN - LIMIT OF CELL 7 OVERBUILD
2002	441744.90	1867803.99	731.64	SLOPE CREST - GRADE BREAK
2003	441912.59	1867836.92	728.00	TIE INTO EXISTING TOPO
2004	441921.83	1867867.79	728.10	GRADE BREAK
2005	441744.90	1868254.00	731.64	SLOPE CREST - CELL BOUNDARY 9
2006	441870.99	1868330.98	729.12	TOP OF HAUL ROAD
2007	441826.93	1868330.98	730.00	GRADE BREAK
2008	441744.90	1868330.98	731.64	GRADE BREAK
2009	441921.82	1868330.98	728.10	TOP OF HAUL ROAD
2010	441948.58	1868455.87	720.00	BASE OF HAUL ROAD
2011	441901.10	1868471.53	720.00	BASE OF HAUL ROAD
2012	441481.97	1868254.00	644.00	TOE OF SLOPE - CELL BOUNDARY 9
2013	441398.74	1868004.00	639.83	CREST OF SUMP
2014	441473.13	1867905.89	641.05	GRADE BREAK
2015	441499.97	1867816.40	650.00	GRADE BREAK
2016	441492.65	1867795.38	652.10	GRADE BREAK
2017*	441492.74	1867792.00	653.91	TIE IN TO CELL 7 & 8
2018*	441072.06	1867796.40	652.00	TIE IN TO CELL 7 & 8
2019	441076.52	1867856.32	646.01	GRADE BREAK
2020*	441017.00	1867804.65	652.00	GRADE BREAK - TIE IN TO CELL 7 & 8
2021	441017.00	1867859.95	646.54	GRADE BREAK
2022*	440961.94	1867796.40	652.00	GRADE BREAK - TIE IN TO CELL 7 & 8
2023	440958.58	1867841.57	647.48	GRADE BREAK
2024*	440560.79	1867791.85	652.45	GRADE BREAK - TIE IN TO CELL 7 & 8
2025	440541.26	1867792.00	653.91	GRADE BREAK
2026	440526.36	1867804.00	652.56	GRADE BREAK - TOE OF SLOPE

SUBGRADE DESIGN CONTROL POINTS COORDINATES (WASHINGTON STATE PLANE, FT)

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
2027	440538.73	1868004.00	648.43	GRADE BREAK
2028	440523.27	1868254.00	653.59	TOE OF SLOPE - CELL BOUNDARY 9
2029	440289.10	1868254.00	731.64	SLOPE CREST - CELL BOUNDARY 9
2030	440289.10	1867804.01	731.64	GRADE BREAK
2031	440307.00	1867792.00	732.00	SLOPE CREST TIE IN - LIMIT OF CELL 8 OVERBUILD
2032	440289.10	1867754.00	731.64	CELL BOUNDARY FOR CELLS 7 & 8 TO 9
2033	440114.14	1867804.20	728.14	GRADE BREAK
2034	440025.00	1867653.80	718.49	TIE INTO EXISTING HAUL ROAD
2035	440101.70	1868402.93	724.00	GRADE BREAK
2036	440114.14	1868354.24	728.14	GRADE BREAK
2037	440289.10	1868354.24	731.64	SLOPE CREST - GRADE BREAK
2038	440312.03	1868445.04	724.00	GRADE BREAK
2039	440318.23	1868563.10	721.93	SLOPE CREST - GRADE BREAK
2040	441475.00	1868559.24	720.00	TOP OF CONSTRUCTION RAMP
2041	441499.67	1868563.24	722.00	GRADE BREAK
2042	441481.72	1868517.78	720.00	TOP OF CONSTRUCTION RAMP
2043	441506.39	1868521.78	722.00	TOP OF CONSTRUCTION RAMP BERM
2044	441507.67	1868513.88	722.00	TOP OF CONSTRUCTION RAMP BERM
2045	441713.17	1868512.02	721.07	GRADE BREAK
2046	440533.51	1868419.59	650.17	TOE OF SLOPE - EXTENT OF CELL 9 EXCAVATION
2047	440604.93	1868418.21	649.49	BASE OF CONSTRUCTION RAMP
2048	440619.73	1868378.06	650.14	BASE OF CONSTRUCTION RAMP
2049	440622.55	1868370.42	650.27	BASE OF CONSTRUCTION RAMP BERM
2050	441476.12	1868354.00	642.06	TOE OF SLOPE - EXTENT OF CELL 9 EXCAVATION
2051	440060.42	1868207.68	715.90	EXISTING WATERLINE/FILL STATION SERVICE TEE
2082	440058.01	1868729.04	719.69	TIE INTO EXISTING WATERLINE
2084	440062.76	1868685.09	719.95	EXISTING WATERLINE/FILL STATION SERVICE TEE
2085	440025.00	1868685.00	723.00	CENTER LINE SOUTH ACCESS ROAD



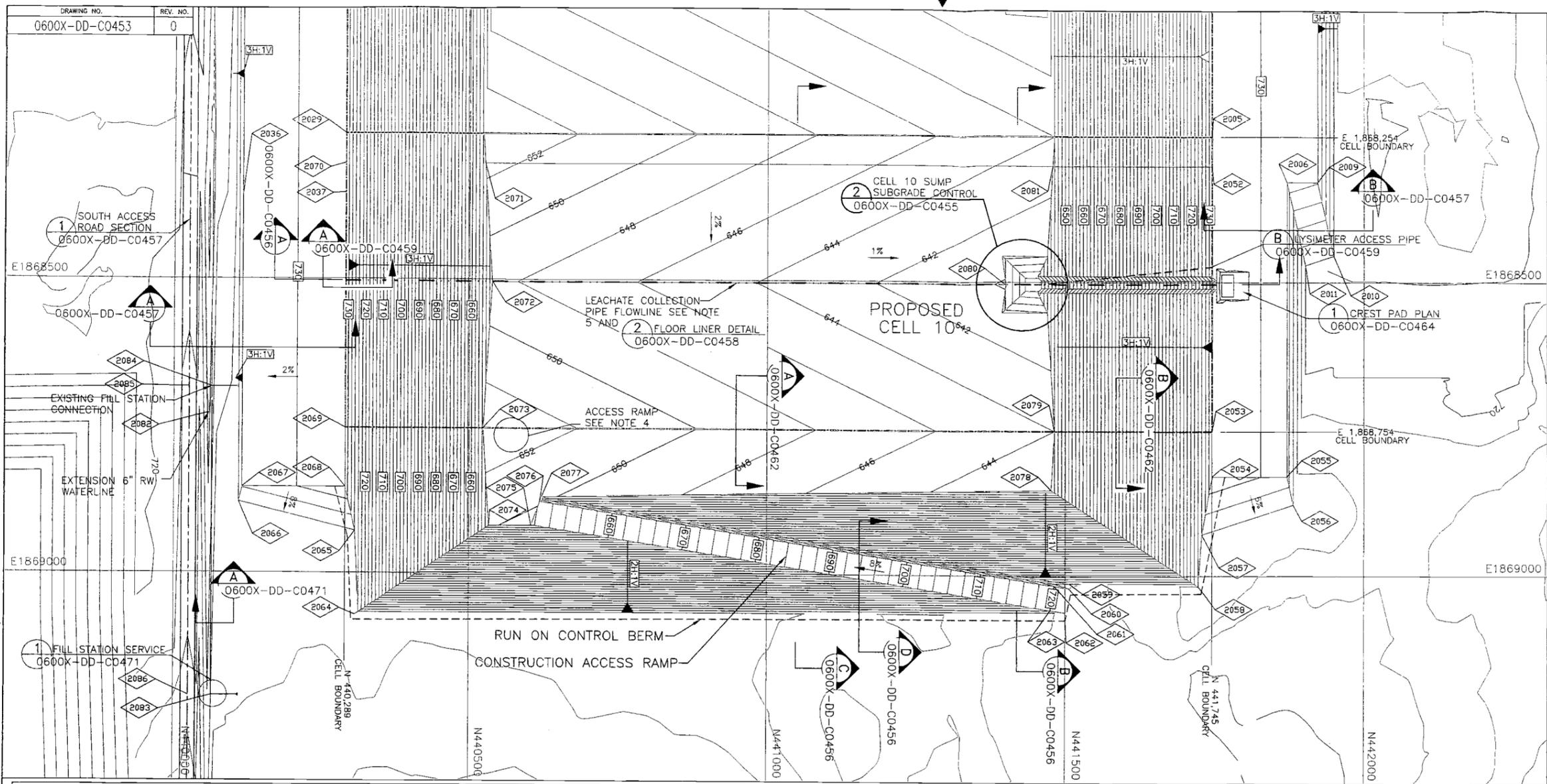
NOTE:
* DENOTES TIE IN FROM PREVIOUS CONSTRUCTION OF CELLS 7 & 8

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16344 SHT01	600G	0111

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0452	0





NOTES

- GRADING TOLERANCES SHOWN ON DWG. NO. 0600-DD-C0458
- EXISTING CONTOURS FROM FIELD SURVEY PREPARED BY ROGERS SURVEYING, INC., DATED JULY, 2006. TOPOGRAPHY DOES NOT REFLECT CHANGES FROM OPERATIONS SINCE JULY 2006. SUBCONTRACTOR SHALL CONSTRUCT FACILITIES TO THE FINISHED ELEVATIONS SHOWN.
- SURVEY DATUM:
VERTICAL NAVD: 88
HORIZONTAL NAD: 83 (91)
- AT COMPLETION OF THE CELL FLOOR THE CONTRACTOR SHALL BUILD A RAMP TO ALLOW ACCESS TO THE OPERATIONS LAYER FROM THE CONSTRUCTION ACCESS RAMP. THE PROPOSED RAMP SHALL BE 30' WIDE AND HAVE A GRADE OF 12%.
- THE LEACHATE COLLECTION PIPE ALIGNMENT SHALL BE INSTALLED TO A ± 6-INCH TOLERANCE TO THE LEACHATE COLLECTION PIPE FLOW LINE.

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WCH - DOCUMENT CONTROL

WASHINGTON CLOSURE HANFORD JOB NO. 14655
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP

1. If work may proceed
2. Review and resubmit. Work may proceed after re-submission
3. Review and resubmit. Work may proceed after re-submission subject to resolution of enclosed comments
4. Review and resubmit. Work may proceed
5. Permission to proceed not required

Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials as verified or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from all compliance with contractual obligations or release any "hold" placed on the contract.

W.A. [Signature] 11-23-2009
SOLVEX SUBGRADE CONTROL

JOHN CARL BRIDGES
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
42168

SUBGRADE DESIGN CONTROL POINTS COORDINATES (WASHINGTON STATE PLANE, FT)

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
2005*	441744.90	1868254.00	731.64	CELL BOUNDARY FOR CELLS 9 & 10
2006*	441870.99	1868330.98	729.12	TOP OF HAUL ROAD
2009*	441921.82	1888330.98	728.10	TOP OF HAUL ROAD
2010*	441948.58	1868455.87	720.00	BASE OF HAUL ROAD
2011*	441901.10	1868471.53	720.00	BASE OF HAUL ROAD
2029*	440523.26	1868254.00	731.64	CREST OF SLOPE - CELL BOUNDARY 9 & 10
2036*	440114.14	1868354.24	728.14	GRADE BREAK
2037*	440289.10	1868354.24	731.64	SLOPE CREST - GRADE BREAK
2052	441744.90	1868304.00	731.64	SLOPE CREST - CELL 10 BOUNDARY
2053	441744.90	1868754.00	731.64	SLOPE CREST - CELL 10 BOUNDARY
2054	441744.90	1868830.98	731.64	SLOPE CREST - GRADE BREAK
2055	441870.99	1868831.01	729.12	GRADE BREAK
2056	441881.29	1868879.07	726.00	GRADE BREAK
2057	441727.97	1868929.67	726.00	GRADE BREAK
2058	441721.97	1869017.88	724.00	GRADE BREAK
2059	441507.67	1869013.88	722.00	TOP OF CONSTRUCTION RAMP BERM
2060	441506.39	1869021.78	722.00	TOP OF CONSTRUCTION RAMP BERM
2061	441481.72	1869017.78	720.00	TOP OF CONSTRUCTION RAMP
2062	441499.67	1869063.24	722.00	GRADE BREAK
2063	441474.99	1869059.24	720.00	TOP OF CONSTRUCTION RAMP
2064	440306.03	1869071.24	726.00	SLOPE CREST - GRADE BREAK
2065	440306.03	1868929.00	726.00	GRADE BREAK

SUBGRADE DESIGN CONTROL POINTS COORDINATES (WASHINGTON STATE PLANE, FT)

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
2066	440107.71	1868879.42	726.00	GRADE BREAK
2067	440114.14	1868854.24	731.64	GRADE BREAK
2068	440289.10	1868821.93	731.64	SLOPE CREST - GRADE BREAK
2069	440289.10	1868754.00	731.64	SLOPE CREST - CELL 10 BOUNDARY
2070*	440289.10	1868304.00	731.64	SLOPE CREST - TIE INTO CELL 9
2071	440526.36	1868304.00	653.95	TOE OF SLOPE - TIE INTO CELL 9
2072	440538.73	1868504.00	648.43	GRADE BREAK
2073	440523.27	1868754.00	653.58	TOE OF SLOPE - CELL 10 BOUNDARY
2074	440533.51	1868919.59	650.17	TOE OF SLOPE - LIMIT OF CELL 10 EXCAVATION
2075	440604.93	1868918.21	649.49	BASE OF CONSTRUCTION ACCESS RAMP
2076	440619.73	1868878.06	650.14	BASE OF CONSTRUCTION ACCESS RAMP
2077	44622.55	186870.42	650.27	BASE OF CONSTRUCTION ACCESS RAMP BERM
2078	441476.15	1868854.00	642.06	TOE OF SLOPE - LIMIT OF CELL 10 EXCAVATION
2079	441481.97	1868754.00	644.00	TOE OF SLOPE - CELL 10 BOUNDARY
2080	441398.74	1868504.00	639.83	CREST OF SUMP
2081*	441479.06	1868304.00	643.03	TOE OF SLOPE - TIE IN CELL 9
2082	440058.01	1868729.04	719.69	TIE INTO EXISTING WATERLINE
2083	440058.01	1869210.00	719.69	EXTENT OF WATERLINE/FILL STATION TEE
2084	440062.76	1868685.09	720.00	EXISTING WATERLINE/FILL STATION SERVICE TEE
2085	440025.00	1868685.00	723.00	CENTER LINE SOUTH ACCESS ROAD
2086	440025.00	1869210.00	725.00	CENTER LINE SOUTH ACCESS ROAD

NOTE:
* DENOTES TIE IN FROM PREVIOUS CONSTRUCTION OF CELL 9



RECORD INFORMATION

RECORD NO.	BLDG. NO.	INDEX NO.
H-6-16345 SHT01	600G	0111

SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

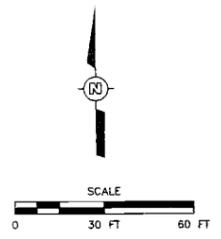
WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
SUBGRADE SURVEY CONTROL - CELL 10

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0453.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0453	0

- ELEVATIONS SHOWN ARE NOMINAL. ACTUAL ELEVATIONS SHALL BE DETERMINED BY MINIMUM REQUIRED COMPONENT THICKNESS PER GRADING TOLERANCE ON DWG NO. 0600X-DD-C0458.
- SURVEY DATUM
VERTICAL NAVD: 88
HORIZONTAL NAD: 83 (91)
- LYSIMETER SUMP LOCATED BELOW SUBGRADE LEVEL. SUBGRADE FOR LYSIMETER ACCESS PIPE NOT SHOWN IN ENTIRETY. SUBGRADE BREAK LINES SHOWN FOR REFERENCE.
- SEE 0600X-DD-C0460 AND 0600X-DD-C0461 FOR EXTENT OF LYSIMETER GEOMEMBRANE LIMITS.



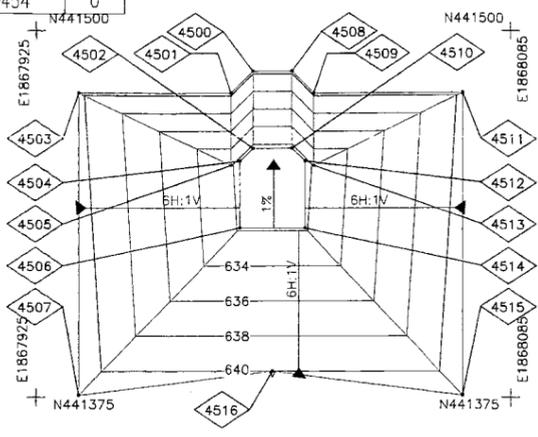
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NOV 21 2009
WCH DOCUMENT CONTROL

WASHINGTON CLOSURE HANFORD
SUBGRADING CONTRACTOR DOCUMENT STATUS STAMP

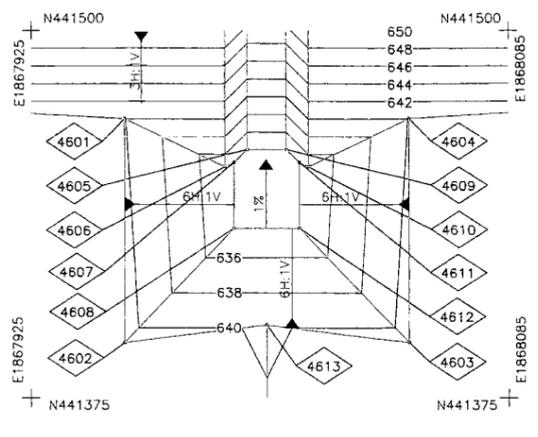
1. Work may proceed
2. Review and resubmit. Work may proceed after re-submission.
3. Review and resubmit. Work may proceed after re-submission subject to resolution of indicated numbers.
4. Review and resubmit. Work may not proceed.
5. Permission to proceed not required.

Permitted to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.

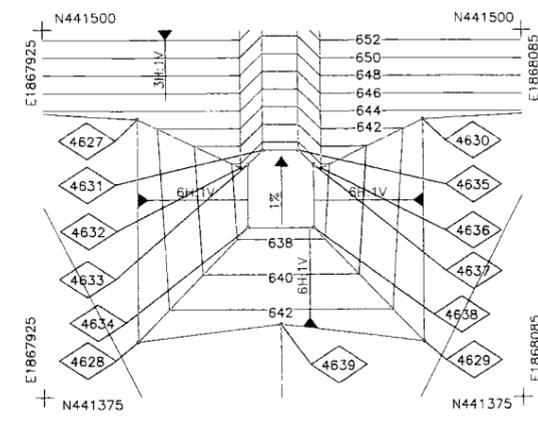
DATE: 11-23-2009
BY: V.A. B...
PROJECT: 506X524R00C003-05-014-028



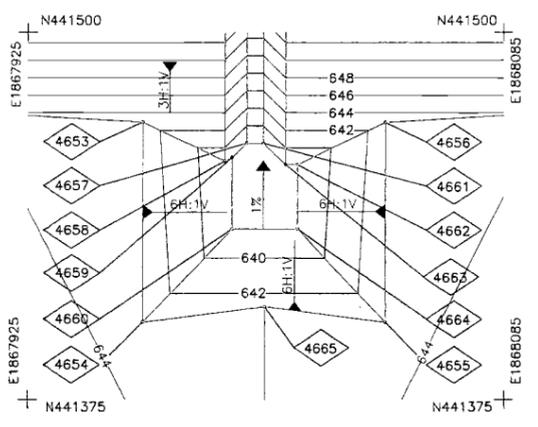
CELL 9 SUMP
1 LYSIMETER SUMP PLAN



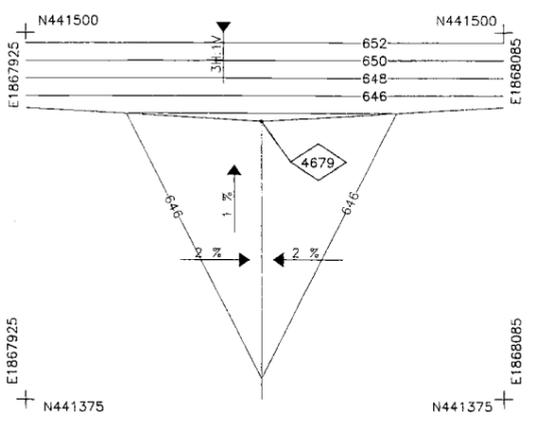
CELL 9 SUMP
2 SUBGRADE CONTROL



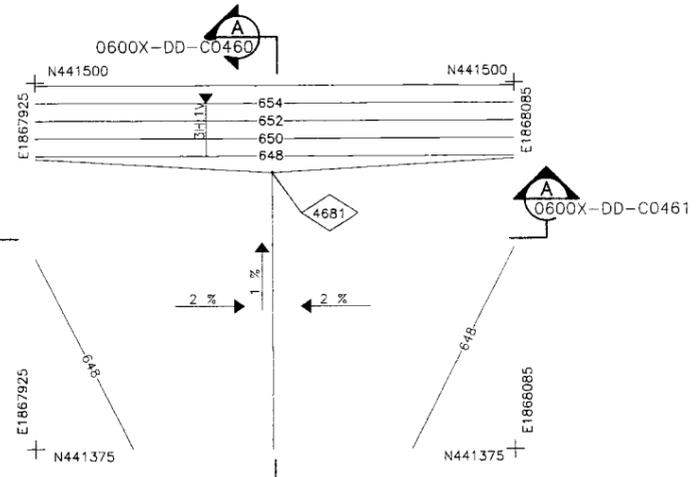
CELL 9 SUMP
3 TOP OF COMPACTED ADMIX LAYER



CELL 9 SUMP
4 TOP OF SECONDARY DRAINAGE LAYER



CELL 9 SUMP
5 TOP OF PRIMARY DRAINAGE LAYER

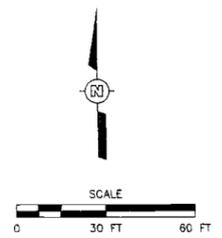


CELL 9 SUMP
6 TOP OF OPERATIONS LAYER

SUBGRADE CONTROL POINTS COORDINATES (WASHINGTON STATE PLANE, FT)

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
CELL 9 LYSIMETER														
4500	441486.36	1867997.50	640.33	LYS-RISER TRENCH	4604	441470.19	1868051.66	640.07	SG-TOP OF SUMP	4638	441432.87	1868015.00	637.33	ADM-FLOOR OF SUMP
4501	441478.86	1867990.00	644.95	LYS-RISER TRENCH	4605	441459.67	1867997.50	634.07	SG-RISER TRENCH	4639	441399.96	1868004.00	642.82	ADM-TOP OF SUMP
4502	441460.07	1867997.50	631.56	LYS-FLR OF SUMP	4606	441453.85	1867990.00	634.62	SG-SLOPE BREAK	CELL 9 SECONDARY DRAINAGE LAYER				
4503	441478.86	1867939.29	640.33	LYS-TOP OF SUMP	4607	441455.30	1867993.00	634.11	SG-FLOOR OF SUMP	4653	441469.32	1867963.16	642.94	DLS-TOP OF SUMP
4504	441455.70	1867993.00	631.61	LYS-FLR OF SUMP	4608	441432.87	1867993.00	634.33	SG-FLOOR OF SUMP	4654	441401.13	1867963.16	643.63	DLS-TOP OF SUMP
4505	441454.24	1867990.00	632.12	LYS-SLOPE BRK	4609	441459.67	1868010.50	634.07	SG-RISER TRENCH	4655	441401.13	1868044.84	643.63	DLS-TOP OF SUMP
4506	441432.87	1867993.00	631.83	LYS-TOP OF SUMP	4610	441453.85	1868018.00	634.62	SG-SLOPE BREAK	4656	441469.32	1868044.84	642.94	DLS-TOP OF SUMP
4507	441375.74	1867939.29	641.36	LYS-TOP OF SUMP	4611	441455.30	1868015.00	634.11	SG-FLOOR OF SUMP	4657	441462.11	1867998.00	638.04	DLS-TOP OF SUMP
4508	441486.36	1868010.50	640.33	LYS-RISER TRENCH	4612	441432.87	1868015.00	634.33	SG-FLOOR OF SUMP	4658	441456.04	1867990.50	638.52	DLS-SLOPE BREAK
4509	441478.86	1868018.00	640.33	LYS-RISER TRENCH	4613	441399.96	1868004.00	639.82	SG-TOP OF SUMP	4659	441457.26	1867993.00	638.09	DLS-FLOOR OF SUMP
4510	441460.07	1868010.50	631.56	LYS-FLR OF SUMP	CELL 9 ADMIX					4660	441432.87	1867993.00	638.33	DLS-FLOOR OF SUMP
4511	441478.86	1868068.71	640.33	LYS-TOP OF SUMP	4627	441469.72	1867956.34	643.08	ADM-TOP OF SUMP	4661	441462.11	1868003.50	638.04	DLS-FLOOR OF SUMP
4512	441455.70	1868015.00	631.61	LYS-FLR OF SUMP	4628	441393.87	1867956.34	643.83	ADM-TOP OF SUMP	4662	441454.83	1868015.00	638.11	DLS-FLOOR OF SUMP
4513	441454.24	1868018.00	632.12	LYS-SLOPE BREAK	4629	441394.03	1868051.66	643.83	ADM-TOP OF SUMP	4663	441454.83	1868011.00	638.11	DLS-FLOOR OF SUMP
4514	441432.87	1868015.00	631.83	LYS-FLR OF SUMP	4630	441469.71	1868051.66	643.08	ADM-TOP OF SUMP	4664	441432.87	1868015.00	638.33	DLS-FLOOR OF SUMP
4515	441375.74	1868068.71	641.36	LYS-TOP OF SUMP	4631	441459.20	1867998.00	637.07	ADM-FLOOR OF SUMP	4665	441406.34	1868004.00	642.76	DLS-TOP OF SUMP
4516	441384.00	1868004.00	639.98	LYS-TOP OF SUMP	4632	441453.13	1867990.50	637.55	ADM-SLOPE BREAK	CELL 9 PRIMARY DRAINAGE LAYER				
CELL 9 SUBGRADE														
4601	441470.19	1867956.34	640.07	SG-TOP OF SUMP	4633	441454.35	1867993.00	637.12	ADM-FLOOR OF SUMP	4679	441469.85	1868004.00	643.12	DLP-SLOPE BREAK
4602	441393.87	1867956.34	640.83	SG-TOP OF SUMP	4634	441432.87	1867993.00	637.33	ADM-FLOOR OF SUMP	CELL 9 OPERATIONS LAYER				
4603	441393.87	1868051.66	640.83	SG-TOP OF SUMP	4635	441459.20	1868010.00	637.07	ADM-FLOOR OF SUMP	4681	441469.38	1868004.00	646.13	OPS-SLOPE BREAK
					4636	441453.13	1868017.50	637.55	ADM-SLOPE BREAK					
					4637	441454.35	1868015.00	637.12	ADM-FLOOR OF SUMP					

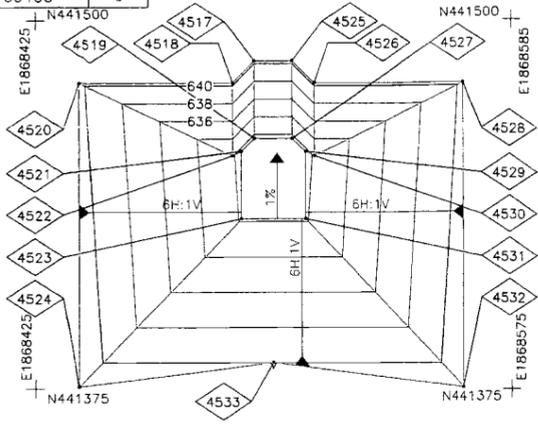
- ELEVATIONS SHOWN ARE NOMINAL. ACTUAL ELEVATIONS SHALL BE DETERMINED BY MINIMUM REQUIRED COMPONENT THICKNESS PER GRADING TOLERANCE ON DWG NO. 0600X-DD-C0458.
- SURVEY DATUM
VERTICAL NAVD: 88
HORIZONTAL NAD: 83 (91)
- LYSIMETER SUMP LOCATED BELOW SUBGRADE LEVEL. SUBGRADE FOR LYSIMETER ACCESS PIPE NOT SHOWN IN ENTIRETY. SUBGRADE BREAK LINES SHOWN FOR REFERENCE.
- SEE 0600X-DD-C0460 AND 0600X-DD-C0461 FOR EXTENT OF LYSIMETER GEOMEMBRANE LIMITS.



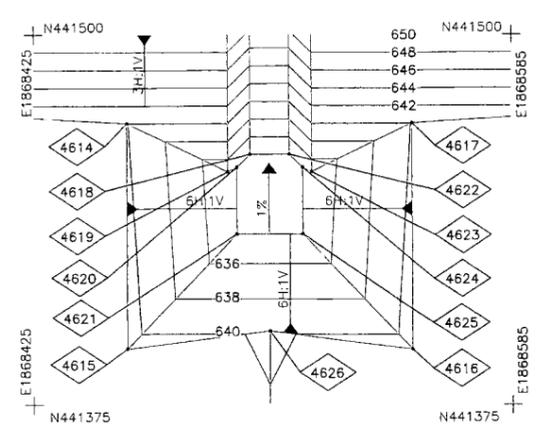
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NOV 21 2009
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DOCUMENT CONTROL *De Matton*

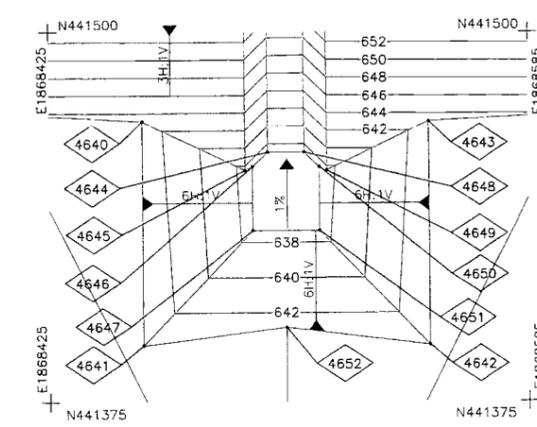
WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
<input type="checkbox"/>	Work may proceed.	<input type="checkbox"/>	Review and resolve. Work may proceed after resolution of indicated comments.
<input type="checkbox"/>	Review and resolve. Work may proceed after resolution of indicated comments.	<input type="checkbox"/>	Review and resolve. Work may not proceed.
<input type="checkbox"/>	Review and resolve. Work may not proceed.	<input type="checkbox"/>	Permittee is advised not required.
Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contractual obligations or release any "hold" placed on the contract.			
DATE	BY	DATE	BY
11-23-2009	W.A. Palomay		
DOCUMENT ID NUMBER: 0600X-DD-C0455		SUBMITTAL	



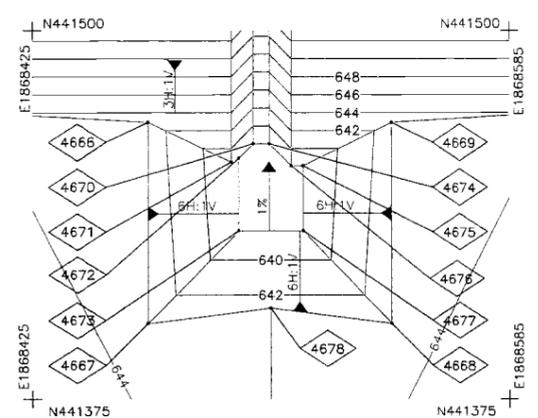
CELL 10 SUMP
① LYSIMETER SUMP PLAN



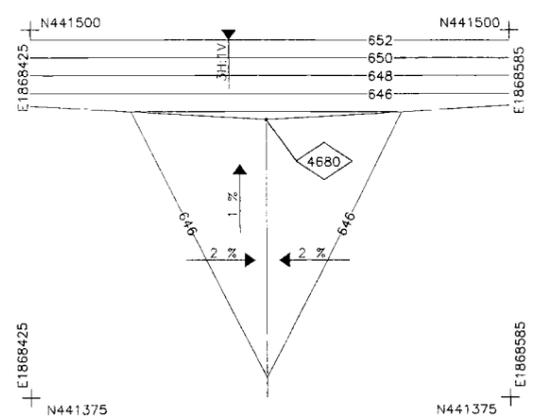
CELL 10 SUMP
② SUBGRADE CONTROL
0600X-DD-C0453



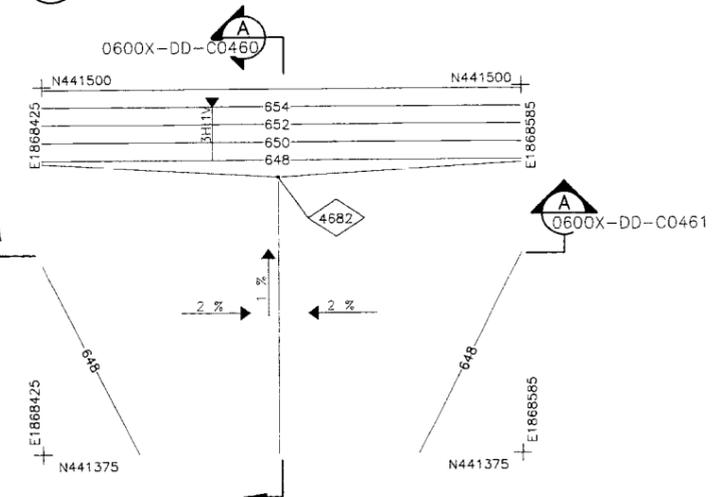
CELL 10 SUMP
③ TOP OF COMPACTED ADMIX LAYER



CELL 10 SUMP
④ TOP OF SECONDARY DRAINAGE LAYER



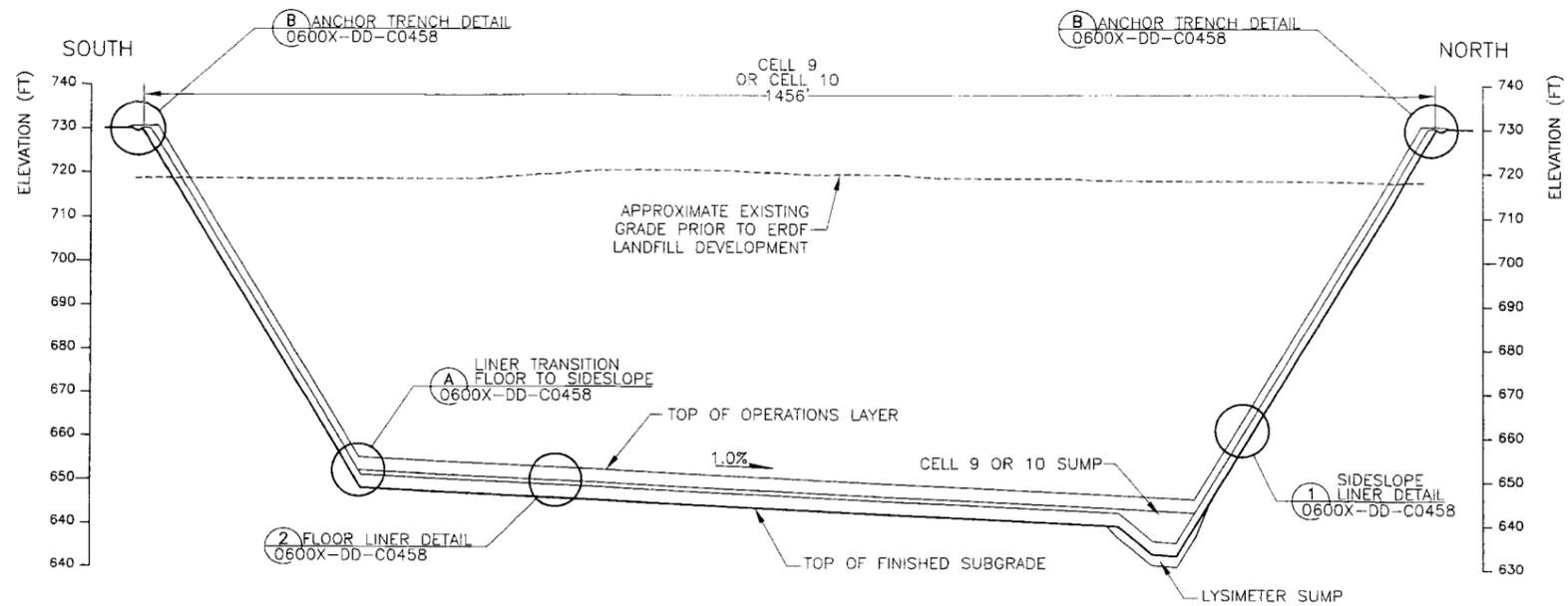
CELL 10 SUMP
⑤ TOP OF PRIMARY DRAINAGE LAYER



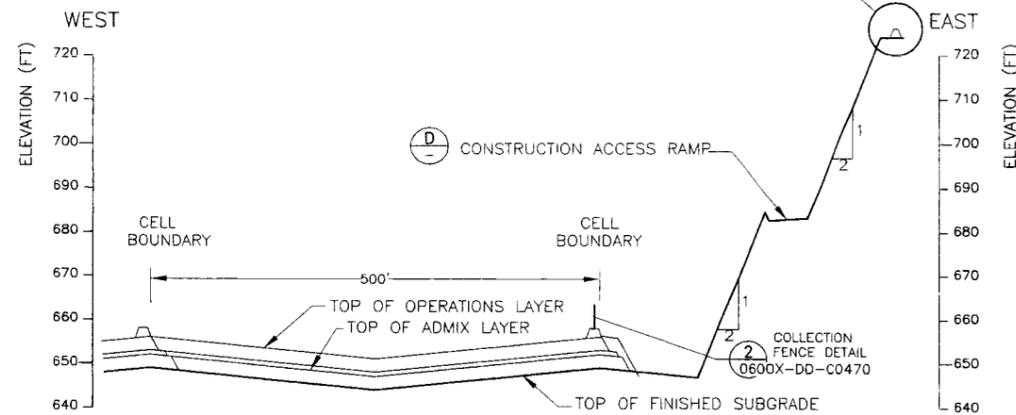
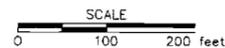
CELL 10 SUMP
⑥ TOP OF OPERATIONS LAYER

SUBGRADE CONTROL POINTS COORDINATES (WASHINGTON STATE PLANE, FT)

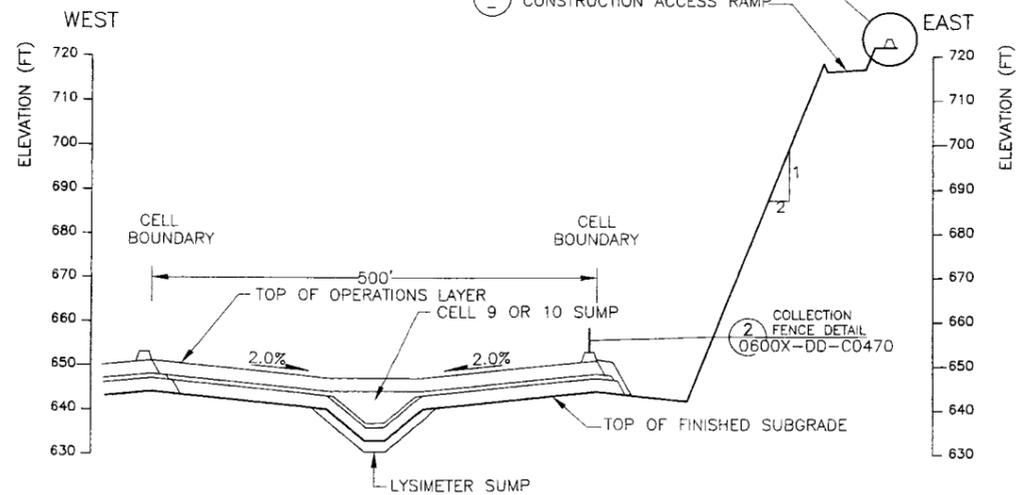
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
CELL 10 LYSIMETER														
4517	441486.36	1868497.50	640.33	LYS-RISER TRENCH	4617	441470.19	1868551.66	640.07	SG-TOP OF SUMP	4651	441432.87	1868515.00	637.33	ADM-FLOOR OF SUMP
4518	441478.86	1868490.00	644.95	LYS-RISER TRENCH	4618	441459.67	1868497.50	634.07	SG-RISER TRENCH	4652	441399.96	1868504.00	642.82	ADM-TOP OF SUMP
4519	441460.07	1868497.50	631.56	LYS-FLR OF SUMP	4619	441453.85	1868490.00	634.62	SG-SLOPE BREAK	CELL 10 SECONDARY DRAINAGE LAYER				
4520	441478.86	1868439.29	640.33	LYS-TOP OF SUMP	4620	441455.30	1868493.00	634.11	SG-FLOOR OF SUMP	4666	441469.32	1868463.16	642.94	DLS-TOP OF SUMP
4521	441455.70	1868493.00	631.61	LYS-FLR OF SUMP	4621	441432.87	1868493.00	634.33	SG-FLOOR OF SUMP	4667	441401.13	1868463.16	643.63	DLS-TOP OF SUMP
4522	441454.24	1868490.00	632.12	LYS-SLOPE BRK	4622	441459.67	1868510.50	634.07	SG-RISER TRENCH	4668	441401.13	1868544.84	643.63	DLS-TOP OF SUMP
4523	441432.87	1868493.00	631.83	LYS-FLR OF SUMP	4623	441453.85	1868518.00	634.62	SG-SLOPE BREAK	4669	441469.32	1868544.84	642.94	DLS-TOP OF SUMP
4524	441375.74	1868439.29	641.36	LYS-TOP OF SUMP	4624	441455.30	1868515.00	634.11	SG-FLOOR OF SUMP	4670	441462.11	1868498.00	638.04	DLS-FLOOR OF SUMP
4525	441486.36	1868510.50	640.33	LYS-RISER TRENCH	4625	441432.87	1868515.00	634.33	SG-FLOOR OF SUMP	4671	441456.04	1868490.50	638.52	DLS-SLOPE BREAK
4526	441478.86	1868518.00	640.33	LYS-RISER TRENCH	4626	441399.96	1868504.00	639.82	SG-TOP OF SUMP	4672	441457.26	1868493.00	638.09	DLS-FLOOR OF SUMP
4527	441460.07	1868510.50	631.56	LYS-FLR OF SUMP	CELL 10 ADMIX					4673	441432.87	1868493.00	638.33	DLS-FLOOR OF SUMP
4528	441478.86	1868568.71	640.33	LYS-TOP OF SUMP	4640	441469.72	1868456.34	643.08	ADM-TOP OF SUMP	4674	441462.11	1868503.50	638.04	DLS-FLOOR OF SUMP
4529	441455.70	1868515.00	631.61	LYS-FLR OF SUMP	4641	441393.87	1868456.34	643.83	ADM-TOP OF SUMP	4675	441454.83	1868515.00	638.11	DLS-FLOOR OF SUMP
4530	441454.24	1868518.00	632.12	LYS-SLOPE BREAK	4642	441394.03	1868551.66	643.83	ADM-TOP OF SUMP	4676	441454.83	1868511.00	638.11	DLS-FLOOR OF SUMP
4531	441432.87	1868515.00	631.83	LYS-FLR OF SUMP	4643	441469.72	1868551.66	643.08	ADM-TOP OF SUMP	4677	441432.87	1868515.00	638.33	DLS-FLOOR OF SUMP
4532	441375.74	1868568.71	641.36	LYS-TOP OF SUMP	4644	441459.20	1868498.00	637.07	ADM-FLOOR OF SUMP	4678	441406.34	1868504.00	642.76	DLS-TOP OF SUMP
4533	441384.00	1868504.00	639.98	LYS-TOP OF SUMP	4645	441453.13	1868490.50	637.55	ADM-SLOPE BREAK	CELL 10 PRIMARY DRAINAGE LAYER				
CELL 10 SUBGRADE														
4614	441470.19	1868456.34	640.07	SG-TOP OF SUMP	4646	441454.35	1868493.00	637.12	ADM-FLOOR OF SUMP	4680	441469.85	1868504.00	643.12	DLP-SLOPE BREAK
4615	441393.87	1868456.34	640.83	SG-TOP OF SUMP	4647	441432.87	1868493.00	637.33	ADM-FLOOR OF SUMP	CELL 10 OPERATIONS LAYER				
4616	441393.87	1868551.66	640.83	SG-TOP OF SUMP	4648	441459.20	1868510.00	637.07	ADM-FLOOR OF SUMP	4682	441469.38	1868504.00	646.13	OPS-SLOPE BREAK
					4649	441453.13	1868517.50	637.55	ADM-SLOPE BREAK					
					4650	441454.35	1868515.00	637.12	ADM-FLOOR OF SUMP					



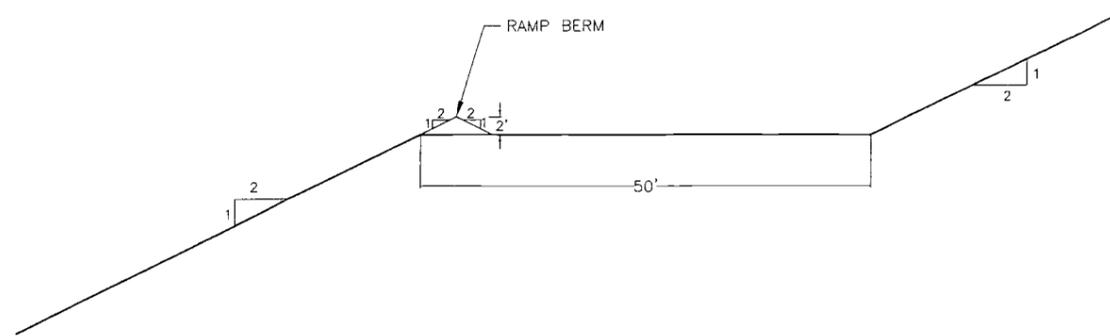
A NORTH-SOUTH SECTION FOR CELLS 9 & 10
0600X-DD-C0452,C0453



C E-W SECTION
0600X-DD-C0453



B E-W SECTION
0600X-DD-C0453



D CONSTRUCTION ACCESS RAMP
0600X-DD-C0453

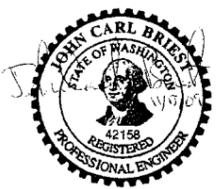


NOTES

1. CROSS-SECTIONS REPRESENT CONFIGURATION AT COMPLETED CELL CONSTRUCTION. HOWEVER, CROSS-SECTION LOCATIONS ARE DEPICTED ON THE SUBGRADE PLAN.

WASHINGTON CLOSURE HANFORD		JOB NO. 14658	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
1	As issued		
2	Revised and resubmitted		
3	Revised and resubmitted		
4	Revised and resubmitted		
5	Final		

11-23-2009
NOV 21 2009
WCH - DOCUMENT CONTROL



DOCUMENT CONTROL *De. Wilson*

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENGR/ENR	SYS ENGR	PROJ ENGR

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

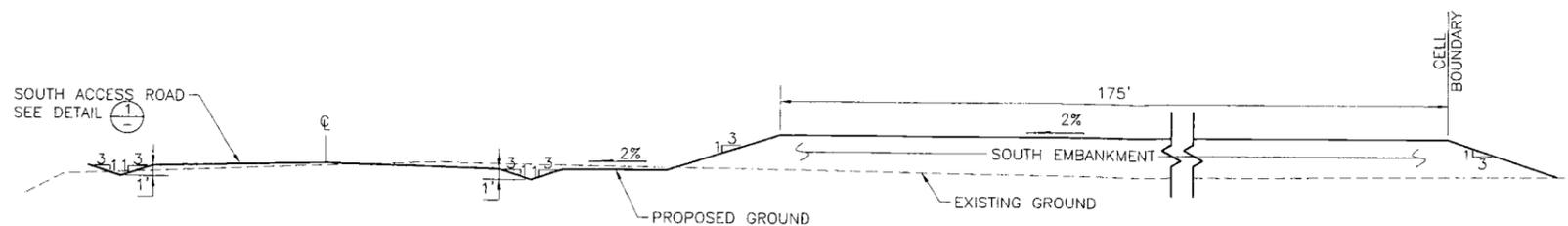
WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

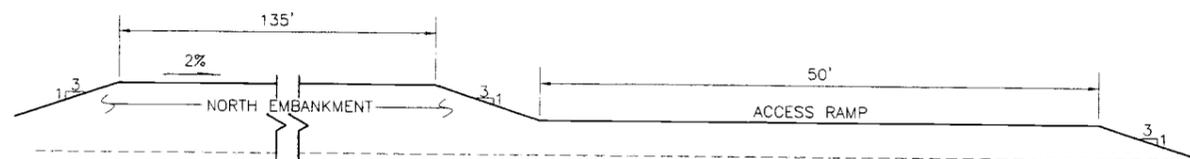
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY CELLS 9 - 10 GENERAL CROSS SECTIONS		
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0456.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0456	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16348 SHT01	600G	0111

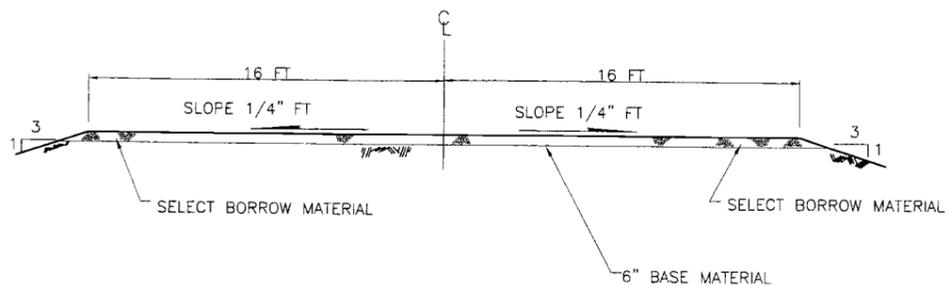
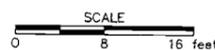
1. CONSTRUCT RUN-ON CONTROL BERM FROM TYPE I FILL.
2. FLATTEN RUN-ON CONTROL BERM SLOPES AT ENTRANCE TO CONSTRUCTION ACCESS RAMP AS REQUIRED FOR VEHICLE ACCESS. SLOPE AWAY FROM CELLS.



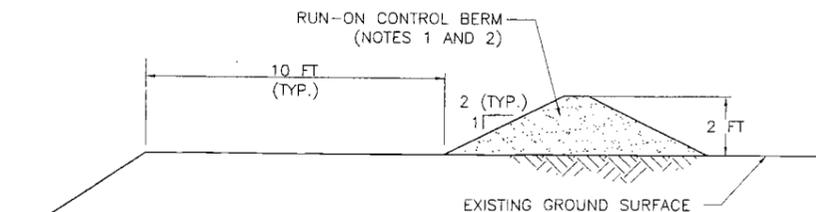
(A) TYPICAL TRENCH BERM SECTION (SOUTH)
0600X-DD-C0452,C0453



(B) TYPICAL TRENCH BERM SECTION (NORTH)
0600X-DD-C0453



(1) SOUTH ACCESS ROAD SECTION
0600X-DD-C0452



(C) RUN-ON CONTROL BERM SECTION
0600X-DD-C0452,C0453,C0456



WASHINGTON CLOSURE HANFORD JOB NO. 14655
SUPPLEMENTARY CONTRACT DOCUMENT STATUS SHEET

1. Work may proceed.
2. Review and resolve. Work may proceed after re-submission.
3. Review and resolve. Work may proceed after resolution of additional comments.
4. Review and resolve. Work may not proceed.
5. Permission is granted not required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contractual obligations or release any "holds" placed on the contract.

NO.	DATE	DESCRIPTION	BY	CHKD	APP'D
1	11-23-2009				

W.A. Taylor
DOCUMENT NUMBER: 506X524A000N03 05 014 031

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NOV 21 2009

WCH - DOCUMENT CONTROL



DOCUMENT CONTROL *See notes*

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENGR/ENGR	SYS ENGR	PROJ ENGR
1	11/13/09	ISSUED FOR AWARD					

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

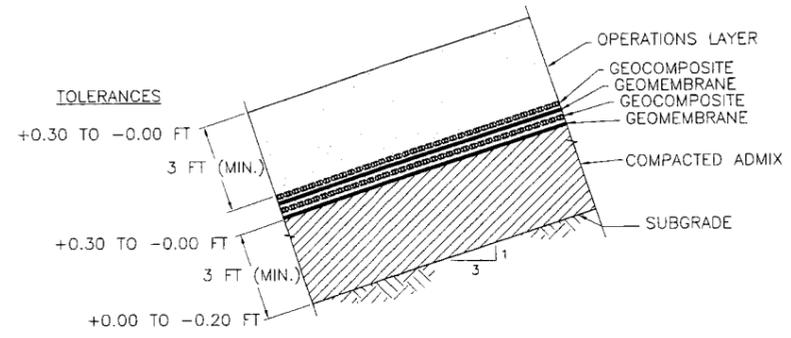
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
CIVIL SECTIONS

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDC0457.DWG
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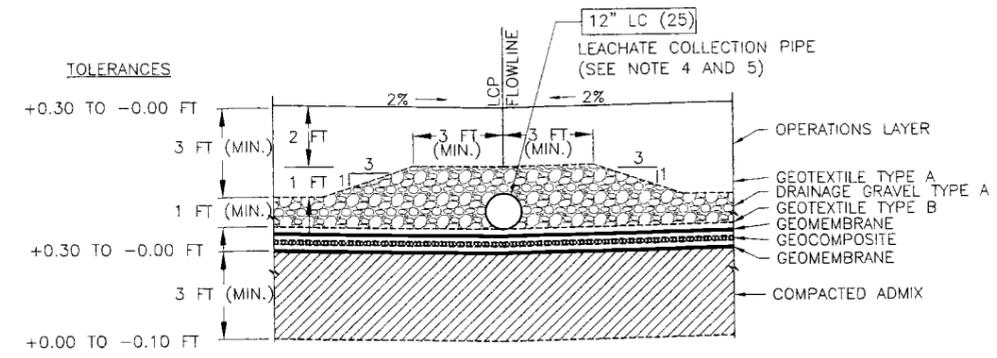
TASK ERDF	DRAWING NO. 0600X-DD-C0457	REV. NO. 0
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RECORD INFORMATION

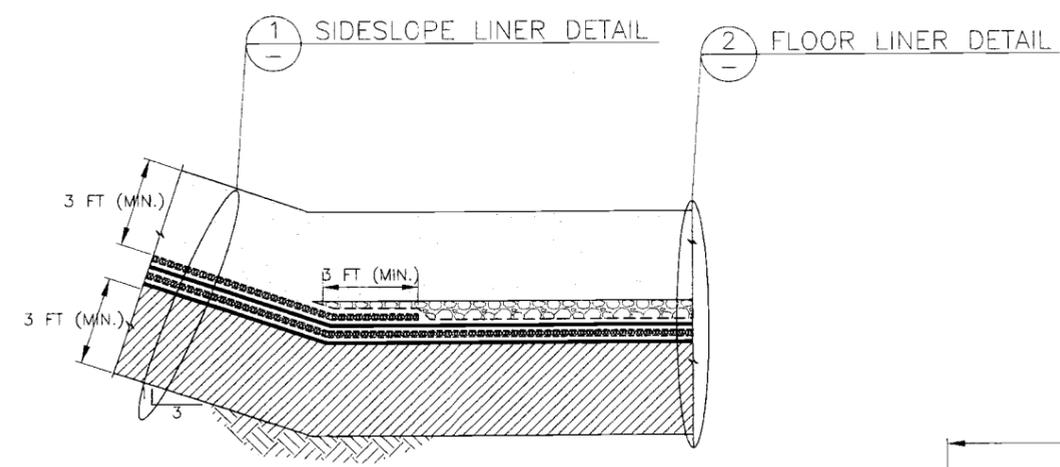
RECORD NO. H-6-16349 SHT01	BLDG NO. 600G	INDEX NO. 0111
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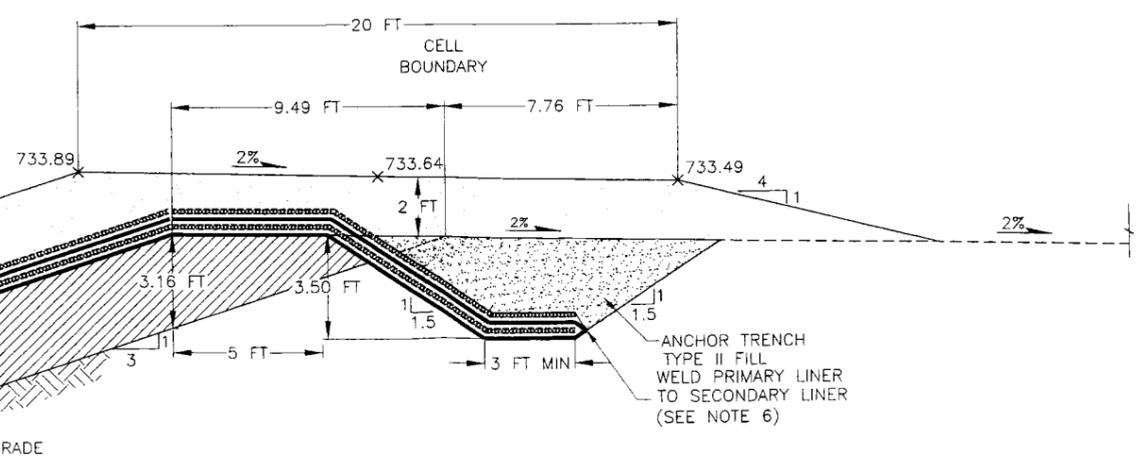
1 SIDESLOPE LINER DETAIL
0600X-DD-C0456,C0459,C0460,C0462,C0463



2 FLOOR LINER DETAIL
0600X-DD-C0456,C0460,C0461,C0462,C0463



A LINER TRANSITION - FLOOR TO SIDESLOPE
0600X-DD-C0456



B ANCHOR TRENCH DETAIL
0600X-DD-C0456



NOTES

1. LINER SYSTEM COMPONENT THICKNESSES EXAGGERATED FOR CLARITY.
2. REFER TO TECHNICAL SPECIFICATIONS FOR CELL CONSTRUCTION FOR MATERIAL, HANDLING, AND INSTALLATION REQUIREMENTS.
3. GRADING TOLERANCES DO NOT RELIEVE CONTRACTOR FROM LINER SYSTEM THICKNESS REQUIREMENTS. LINER SYSTEM THICKNESSES REPRESENT THE MINIMUM ALLOWABLE. AREAS FOUND TO BE LESS THAN THE REQUIRED THICKNESS (EVEN BY MINOR AMOUNTS) WILL REQUIRE RECONSTRUCTION.
4. GRADING TOLERANCES DO NOT RELIEVE CONTRACTOR FROM THE MINIMUM PIPE SLOPE REQUIREMENTS. ALL 12" LC(25) PERFORATED LEACHATE COLLECTION PIPE MUST BE INSTALLED AT A 1% MINIMUM SLOPE.
5. THE LEACHATE COLLECTION PIPE SHALL BE RUN THE ENTIRE LENGTH OF THE CELL FLOOR.
6. 0 TO 6 INCHES TYPE II FILL BETWEEN GEOSYNTHETIC LAYERS ALLOWED WITHIN ANCHOR TRENCH ONLY AND MUST BE MECHANICALLY COMPACTED.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP			
1	Work may proceed		
2	Review and resubmit. Work may proceed prior to resubmission		
3	Review and resubmit. Work may proceed prior to resubmission subject to revision of indicated comments		
4	Review and resubmit. Work may not proceed		
5	Permission to proceed not required		

W.H. Balany 11-23-2009
SOLX594A00CND3-05-014-033

RECEIVED
NOV 21 2009
WCH - DOCUMENT CONTROL



DOCUMENT CONTROL *Dec 11/2009*

REV.	DATE	DESCRIPTION	DRAWN BY	CHECK	ENG'R	SYS	PROJ
1	11/13/09	ISSUED FOR AWARD	MD	JM	SM	N/A	RB

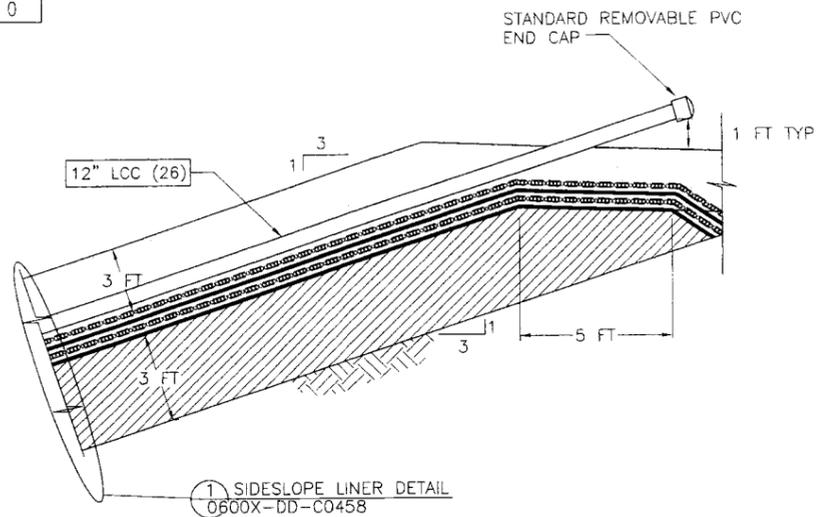
U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS, LLC DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
LINER SYSTEM DETAILS - 1

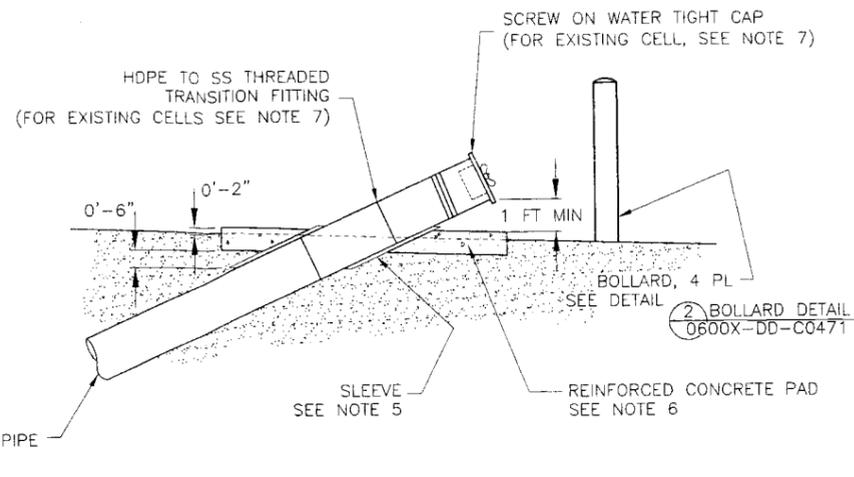
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0458.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0458	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16350 SHT01	600G	0111

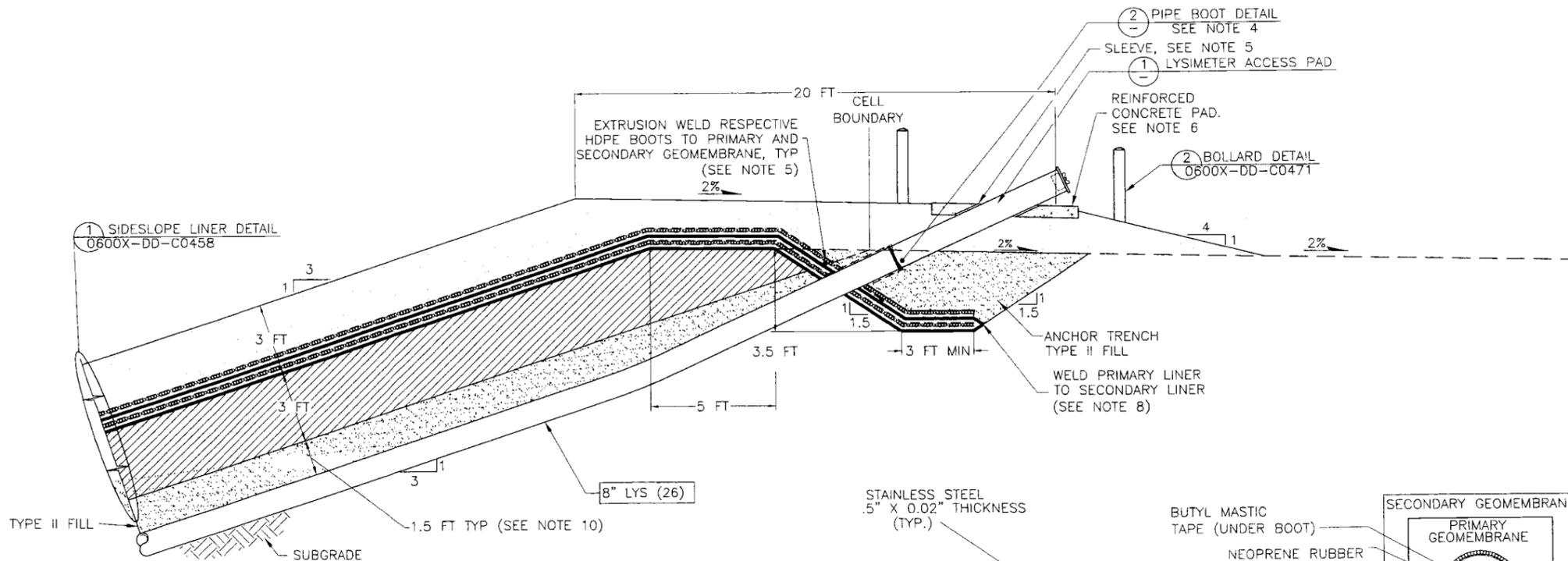


1 SIDESLOPE LINER DETAIL
0600X-DD-C0458

A LEACHATE PIPE CLEANOUT
0600X-DD-C0452, C0453

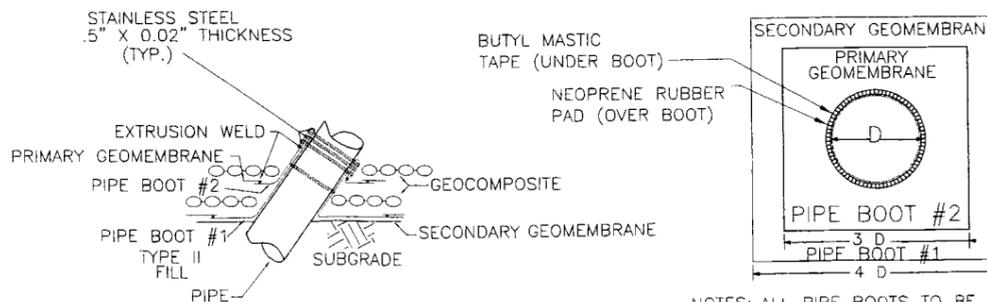


1 LYSIMETER ACCESS PAD



1 SIDESLOPE LINER DETAIL
0600X-DD-C0458

B LYSIMETER ACCESS PIPE
0600X-DD-C0452, C0453, C0464



2 PIPE BOOT DETAIL

- NOTES
1. LINER SYSTEM COMPONENT THICKNESSES EXAGGERATED FOR CLARITY.
 2. REFER TO TECHNICAL SPECIFICATIONS FOR CELL CONSTRUCTION FOR MATERIAL, HANDLING, AND INSTALLATION REQUIREMENTS.
 3. GENTLY SLOPE LYSIMETER PIPE AND TRENCH SUBGRADE TO ENSURE THAT LYSIMETER PIPE PENETRATES LINERS AS SHOWN.
 4. REMOVE GEOCOMPOSITE AS NECESSARY FOR BOOT INSTALLATION TO SECONDARY AND PRIMARY GEOMEMBRANE. FORM BOOT WITH SUFFICIENT MATERIAL TO PREVENT OVERSTRESSING DURING BACKFILLING, BUT WITHOUT FOLDS OR WRINKLES.
 5. FILL ANNULAR SPACE BETWEEN HDPE PIPE AND SLEEVE WITH FLEXIBLE SILICONE SEALANT.
 6. 5-FOOT X 5-FOOT-6" THK REINFORCED CONCRETE SLAB ON GRADE W/ #5 REINFORCING BARS AT 12" OC EW. CENTER REINFORCING IN SLAB.
 7. INSTALL HDPE TO SS THREADED TRANSITION FITTING AND SCREW ON WATER TIGHT CAP TO EXISTING CELLS 5, 6, 7, AND 8, 6" DIAMETER HDPE SDR 11 LYSIMETER PIPES.
 8. 0 TO 6 INCHES TYPE II FILL BETWEEN GEOSYNTHETIC LAYERS IS ALLOWED WITHIN THE ANCHOR TRENCH ONLY.
 9. INSTALL LEACHATE COLLECTION PIPE CLEANOUT UP THE SOUTH SIDESLOPE DIRECTLY ON THE PRIMARY GEOCOMPOSITE.
 10. MAINTAIN 1 FT COVER (MIN) BETWEEN LYSIMETER PIPE AND COMPACTED ADMIX LAYER. PIPE SHALL REMAIN IN CONTINUOUS CONTACT WITH TRENCH BOTTOM ALONG ENTIRE PIPE LENGTH.

WASHINGTON CLOSURE HANFORD
SUPERVISOR/CONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed
 Repair and replace Work may proceed after re-inspection
 Repair and replace Work may proceed prior to re-inspection subject to resolution of noticed comments
 Repair and replace Work may not proceed
 Permittee to proceed not required

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve the supplier/subcontractor from full compliance with contract obligations or release any "hold" placed on the contract.

W.A. B... 11-23-2009
 50652400X N03-05-014-033

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NOV 21 2009
WCH - DOCUMENT CONTROL



DOCUMENT CONTROL

REV.	DATE	DESCRIPTION	DRAWN BY	DRAWN CHK	ORIG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
1	11/23/09	ISSUED FOR AWARD						

SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

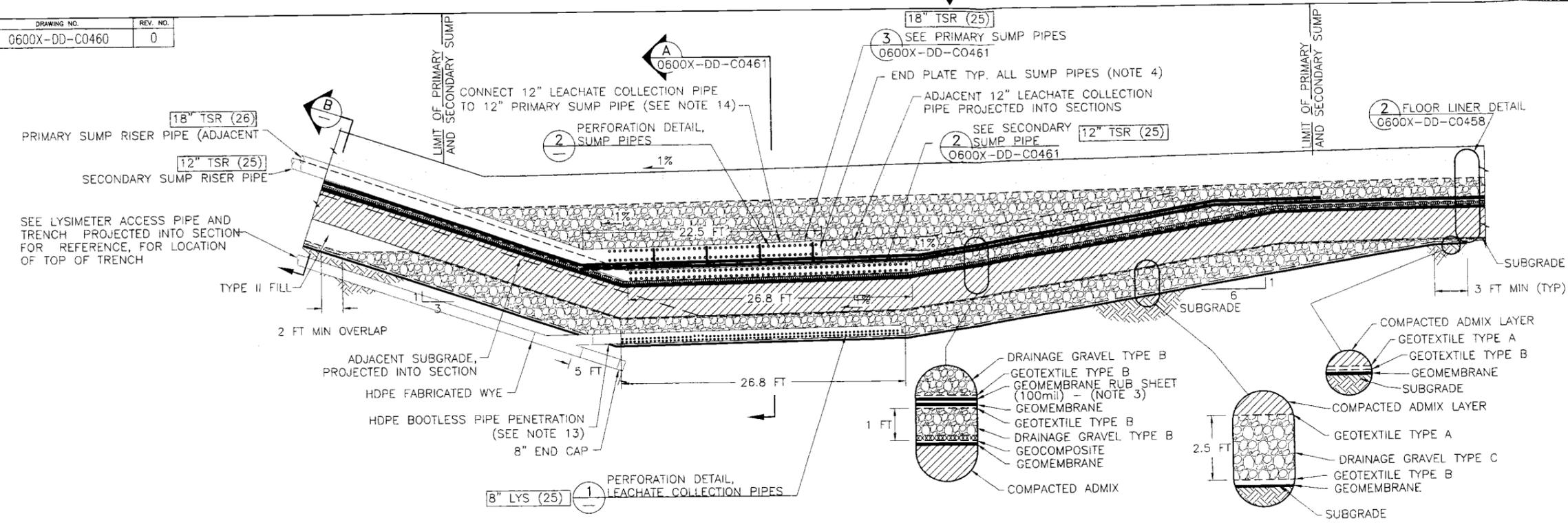
WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
LINER SYSTEM DETAILS - 2

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0459.DWG

RECORD INFORMATION

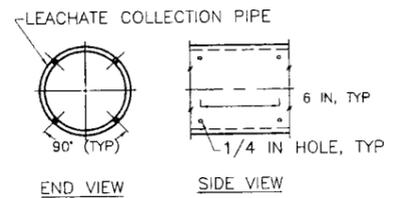
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16351 SHT01	600G	0111



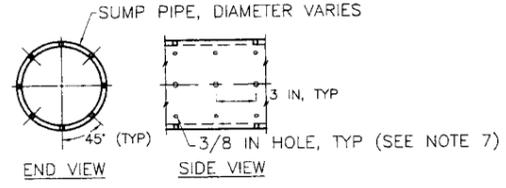
A TYPICAL SUMP SECTION
0600X-DD-C0454, C0455

SCALE
0 6 12 feet

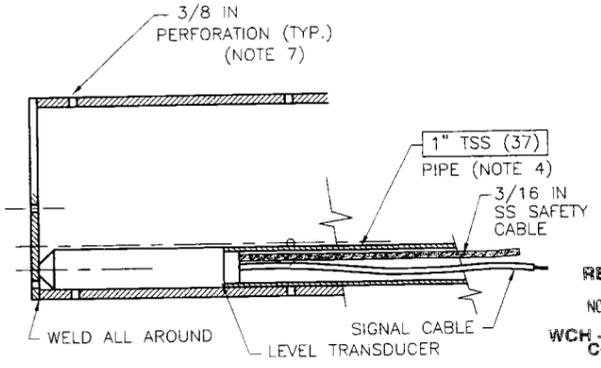
- LINER SYSTEM COMPONENT THICKNESSES EXAGGERATED FOR CLARITY.
- REFER TO TECHNICAL SPECIFICATIONS FOR MATERIAL, HANDLING, AND INSTALLATION REQUIREMENTS.
- RUB SHEET TO EXTEND 5 FT MIN ALONG SLOPE BEYOND LIMITS OF SUMP ALL AROUND.
- WELD END PLATE TO SUMP PIPE AND LYSIMETER PIPES ALL AROUND.
- LEACHATE REMOVAL PUMPS SHALL BE PLACED APPROXIMATELY 15' FROM SIDESLOPE OF SUMP PIPE AT LOWEST ELEVATION.
- SENSOR AND CABLES NOT SHOWN IN SECTION.
- TRANSUDER PIPE PERFORATION PATTERN IS IDENTICAL TO SUMP PIPE PERFORATION PATTERN.
- PIPE ON FLOOR OF SUMP SHALL BE PERFORATED.
- END OF PRIMARY SUMP LEVEL TRANSUDER PIPE SHALL MATCH END OF PRIMARY SUMP PIPE. END OF SECONDARY SUMP LEVEL TRANSUDER PIPE SHALL MATCH END OF SECONDARY SUMP PIPE.
- FITTINGS SHALL NOT BE USED TO TRANSITION SIDE SLOPE PIPE TO PERFORATED PIPE IN SUMP. PIPE BENDS SHALL BE MINIMUM NECESSARY FOR ALIGNMENT AND WITHIN MANUFACTURERS RECOMMENDATIONS.
- TRANSITION FROM (25) SOLID PIPE TO (26) PERFORATED AT TOE OF SIDESLOPE.
- SUMP LEVEL TRANSUDER PIPES IN BOTH SUMPS HAVE A 4-FT SEPARATION FROM THE SUMP PIPES WITHIN THE SUMP AND TRANSITION TO 2.25-FT ON THE SIDESLOPE..
- HDPE BOOTLESS PIPE PENETRATION SHALL BE FABRICATED WITH HDPE FLATSTOCK AND HDPE PIPE. GEOMEMBRANE SHALL BE EXTRUSION WELDED TO HDPE FLATSTOCK.
- THE 12" LEACHATE COLLECTION PIPE SHALL BE CONNECTED AND TRANSITION TO THE 12" PRIMARY SUMP RISER PIPE.



1 PERFORATION DETAIL, LEACHATE COLLECTION PIPE
NTS



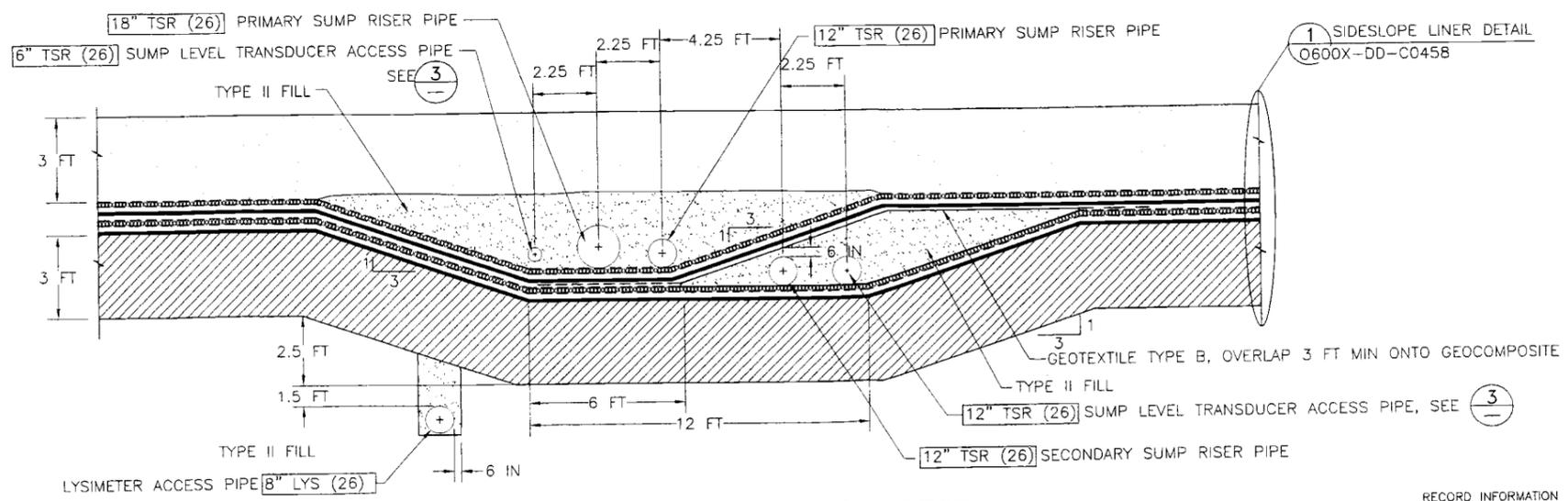
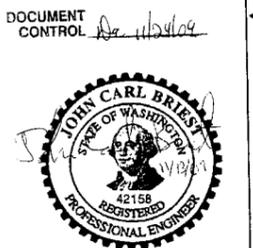
2 PERFORATION DETAIL, SUMP PIPES
NTS



3 SUMP LEVEL TRANSUDER ACCESS PIPE
NTS

RECEIVED
NOV 21 2009
WCH - DOCUMENT CONTROL

WASHINGTON CLOSURE HANFORD		JOB NO. 1455	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
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<input type="checkbox"/>	Revised and resubmitted	<input type="checkbox"/>	Work may proceed prior to resubmission
<input type="checkbox"/>	Revised and resubmitted	<input type="checkbox"/>	Work may proceed prior to resubmission
<input type="checkbox"/>	Revised and resubmitted	<input type="checkbox"/>	Work may proceed prior to resubmission
<input type="checkbox"/>	Revised and resubmitted	<input type="checkbox"/>	Work may proceed prior to resubmission
Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contract specifications or any applicable "rules" placed on the contract.			
W.A. Taylor	11-23-2009	11-23-2009	034
S06X524A000003-05-014		034	



B SIDESLOPE RISER TRENCH SECTION
NTS

REV.	DATE	DESCRIPTION	DRWN BY	DRAFT CHK	ENGR	ENGR	ENGR	ENGR	ENGR

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

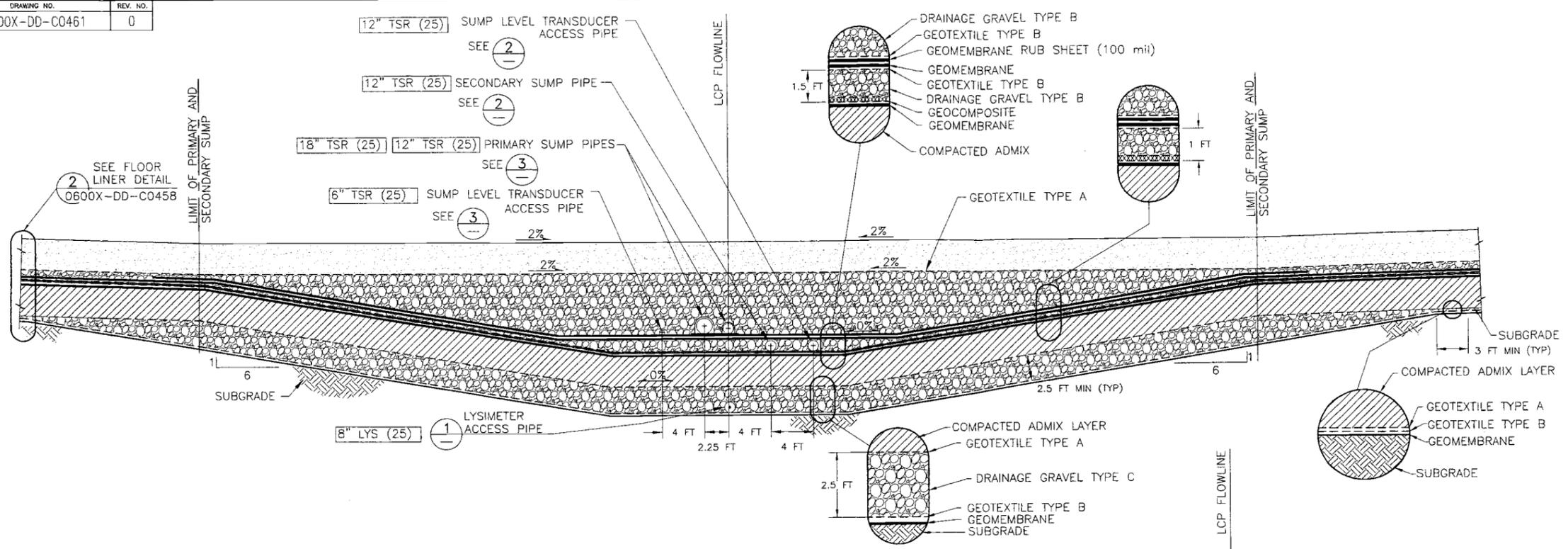
WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
SUMP DETAILS - 1

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0460.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0460	0

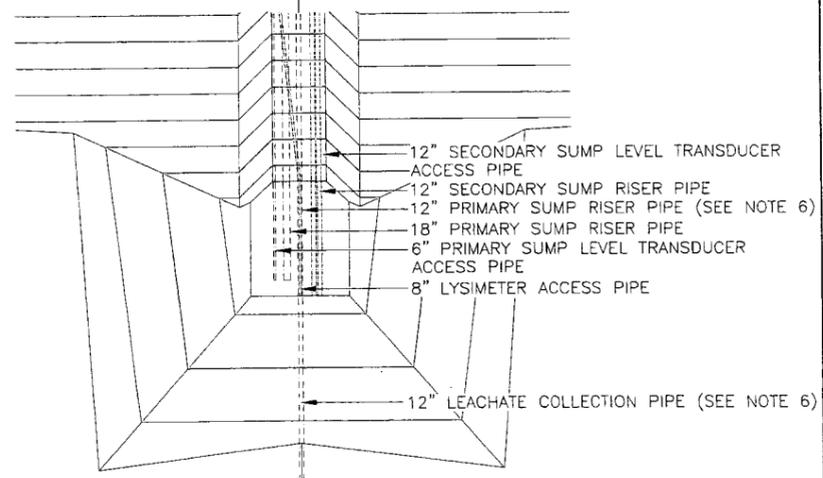
RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16352 SHT01	600G	0111

1. LINER SYSTEM COMPONENT THICKNESSES EXAGGERATED FOR CLARITY.
2. REFER TO TECHNICAL SPECIFICATIONS FOR CELL CONSTRUCTION FOR MATERIAL, HANDLING, AND INSTALLATION REQUIREMENTS.
3. FLAT STOCK SHALL EXTEND UNDER ENTIRE LENGTH OF PIPES AND 6-IN MIN BEYOND PIPE END. ANCHOR PIPES TO FLAT STOCK WITH 1-IN WIDE SS STRAPS AT 5 FT INTERVALS. ATTACH STRAPS TO FLAT STOCK USING STAINLESS STEEL BOLTS AND WASHERS OR SCREWS. FASTENERS SHALL NOT PROTRUDE BEYOND BOTTOM OF FLATS. REFER TO TECHNICAL SPECIFICATIONS FOR PIPING, VALVES, AND SPECIALS REQUIREMENTS.
4. GEOMEMBRANE RUB SHEET (100mil) SHALL EXTEND 5 FT MIN ALONG SLOPE BEYOND LIMITS OF SUMP ALL AROUND. REFER TO TECHNICAL SPECIFICATIONS FOR CELL CONSTRUCTION GEOSYNTHETICS FOR MATERIAL HANDLING AND INSTALLATION REQUIREMENTS.
5. SUMP LEVEL TRANSDUCER PIPES IN BOTH SUMPS HAVE A 4-FT SEPARATION FROM THE SUMP PIPES WITHIN THE SUMP AND TRANSITION TO 2.25-FT ON THE SIDESLOPE.
6. THE 12" LEACHATE COLLECTION PIPE SHALL BE CONNECTED AND TRANSITION TO THE 12" PRIMARY SUMP RISER PIPE.



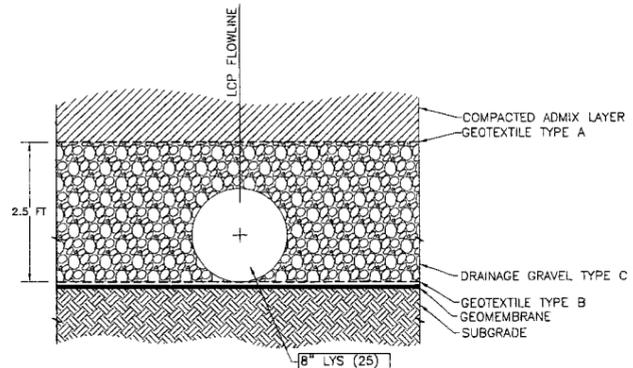
A TYPICAL SUMP SECTION
0600X-DD-C0454, C0455, C0460

SCALE
0 6 12 feet



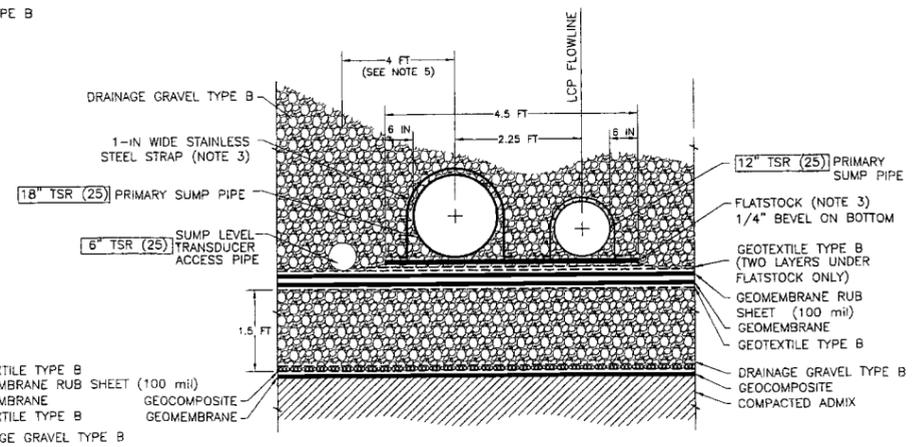
B CELL 9 & 10 SUMP PIPING PLAN
NTS

PIPE	PIPING EASTING COORDINATES	
	CELL 9 EASTING	CELL 10 EASTING
12" LEACHATE COLLECTION PIPE	1,868,004.00	1,868,504.00
8" LYSIMETER ACCESS PIPE	1,868,004.00	1,868,504.00
6" PRIMARY SUMP LEVEL TRANSDUCER ACCESS PIPE FLOOR	1,867,997.75	1,868,497.75
18" PRIMARY SUMP RISER PIPE	1,868,001.75	1,868,501.75
12" PRIMARY SUMP RISER PIPE	1,868,004.00	1,868,504.00
12" SECONDARY SUMP RISER PIPE	1,868,008.00	1,868,508.00
12" SECONDARY SUMP LEVEL TRANSDUCER ACCESS PIPE ON FLOOR	1,868,012.00	1,868,512.00
12" SECONDARY SUMP LEVEL TRANSDUCER ACCESS PIPE SIDESLOPE	1,868,010.25	1,868,510.25
6" PRIMARY SUMP LEVEL TRANSDUCER ACCESS PIPE SIDESLOPE	1,867,999.50	1,868,499.50



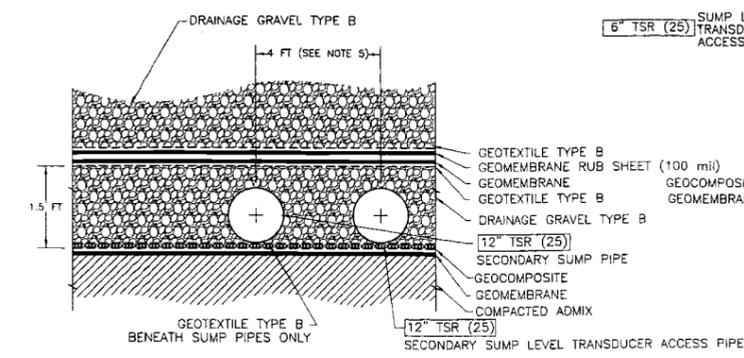
1 LYSIMETER ACCESS PIPE
NTS

SCALE
0 8 16 feet



3 PRIMARY SUMP PIPES
0600X-DD-C0460

SCALE
0 8 16 feet



2 SECONDARY SUMP PIPES
0600X-DD-C0460

SCALE
0 8 16 feet

WASHINGTON CLOSURE HANFORD JOB NO. 14655
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed.
2. Review and resubmit. Work may proceed prior to resubmission.
3. Review and resubmit. Work may proceed prior to resubmission subject to evaluation of additional comments.
4. Review and resubmit. Work may not proceed.
5. D. Resubmission to proceed not required.

Permitted to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contract obligations or release any "holds" placed on the contract.

NO.	DATE	DESCRIPTION	BY
1	11-23-2009	ISSUED FOR AWARD	W.A. BOOS

DOCUMENT NUMBER: 0600X-DD-C0461-035

RECEIVED
NOV 21 2009
WCH - DOCUMENT CONTROL



DOCUMENT CONTROL De 11/24/09

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENGR CHK	N/A	PROJ ENGR
0	11/18/09	ISSUED FOR AWARD						

SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

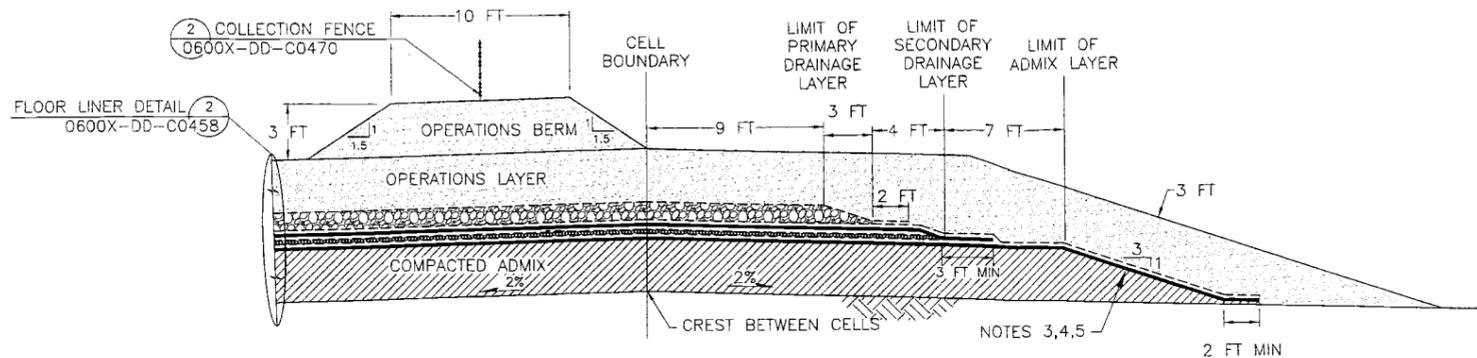
WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

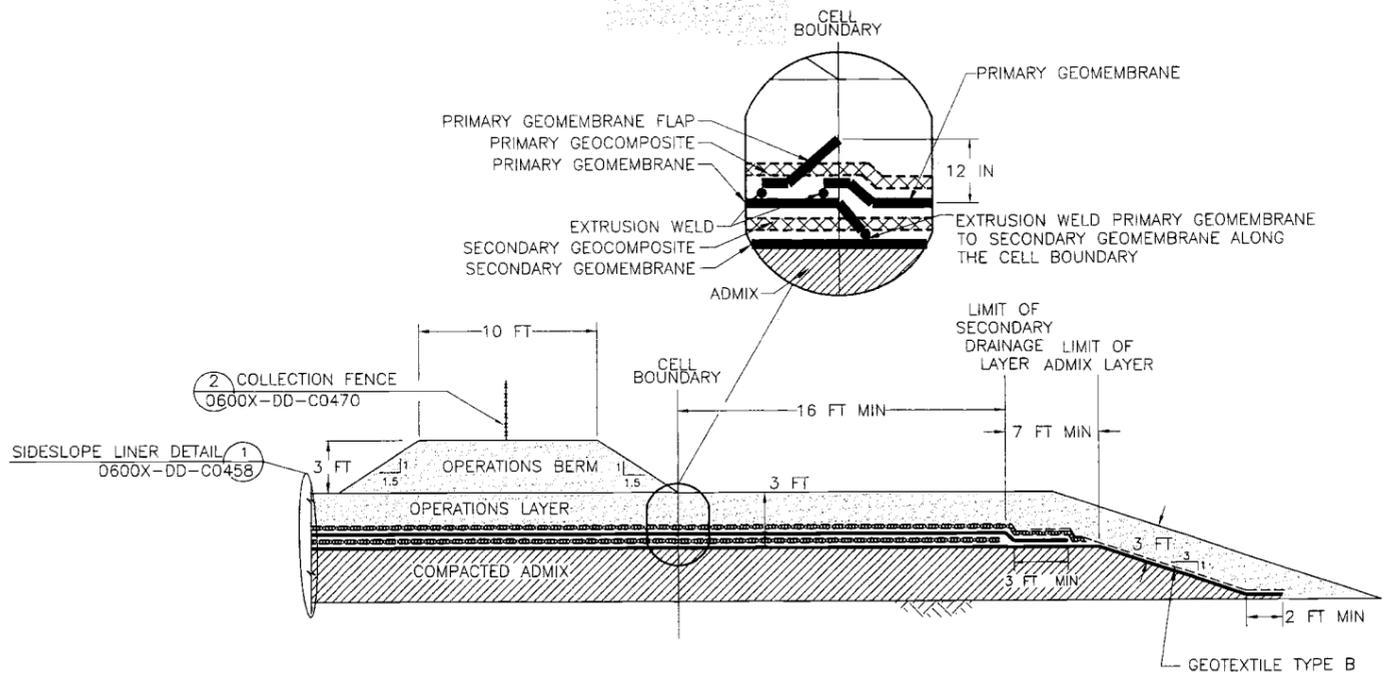
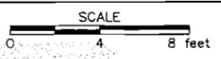
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
SUMP DETAILS - 2

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDC0461.DWG
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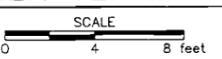
TASK ERDF	DRAWING NO. 0600X-DD-C0461	REV. NO. 0
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A FLOOR LINER TERMINATION SECTION @ EAST CELL BOUNDARY
0600X-DD-C0453



B SIDESLOPE LINER TERMINATION SECTION @ EAST CELL BOUNDARY
0600X-DD-C0453

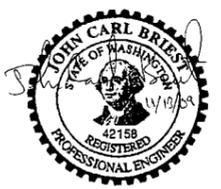


NOTES

1. LINER SYSTEM COMPONENT THICKNESSES EXAGGERATED FOR CLARITY.
2. REFER TO TECHNICAL SPECIFICATIONS FOR CELL CONSTRUCTION FOR MATERIAL, HANDLING, AND INSTALLATION REQUIREMENTS.
3. FOR LINER TIE-IN, REMOVE ANY CRACKED OR OTHERWISE UNSUITABLE EXISTING ADMIX TO THE SATISFACTION OF THE CONTRACTOR.
4. SEAM BETWEEN NEW AND EXISTING ADMIX SHALL BE 3H:1V (TYP) AND NO STEEPER THAN 2.75H:1V.
5. KNEAD NEW ADMIX THOROUGHLY INTO EXISTING ADMIX.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPERVISOR/CONTRACTOR DOCUMENT STATUS STAMP			
<input checked="" type="checkbox"/>	Work may proceed	<input type="checkbox"/>	Review and resubmit. Work may proceed prior to resubmission subject to inclusion of indicated comments.
<input type="checkbox"/>	Review and resubmit. Work may proceed prior to resubmission subject to inclusion of indicated comments.	<input type="checkbox"/>	Review and resubmit. Work may not proceed
<input type="checkbox"/>	Review and resubmit. Work may not proceed	<input type="checkbox"/>	Permission to proceed not required.
<small>Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, and methods or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractor obligations or release any liability placed on the contract.</small>			
DATE	BY	DATE	BY
11-23-2009	W.A. Dancy		
DOCUMENT ID NUMBER		506X524H00C03-05-014-036	
SYNOPTIC		SUBMITTAL	

RECEIVED
NOV 23 2009
WCH - DOCUMENT CONTROL



DOCUMENT CONTROL *Re: 11/23/09*

△									
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△									
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△	11/13/09	ISSUED FOR AWARD	MM	MM	MM	MM	MM	MM	MM
REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR	

SCALE: AS SHOWN
U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

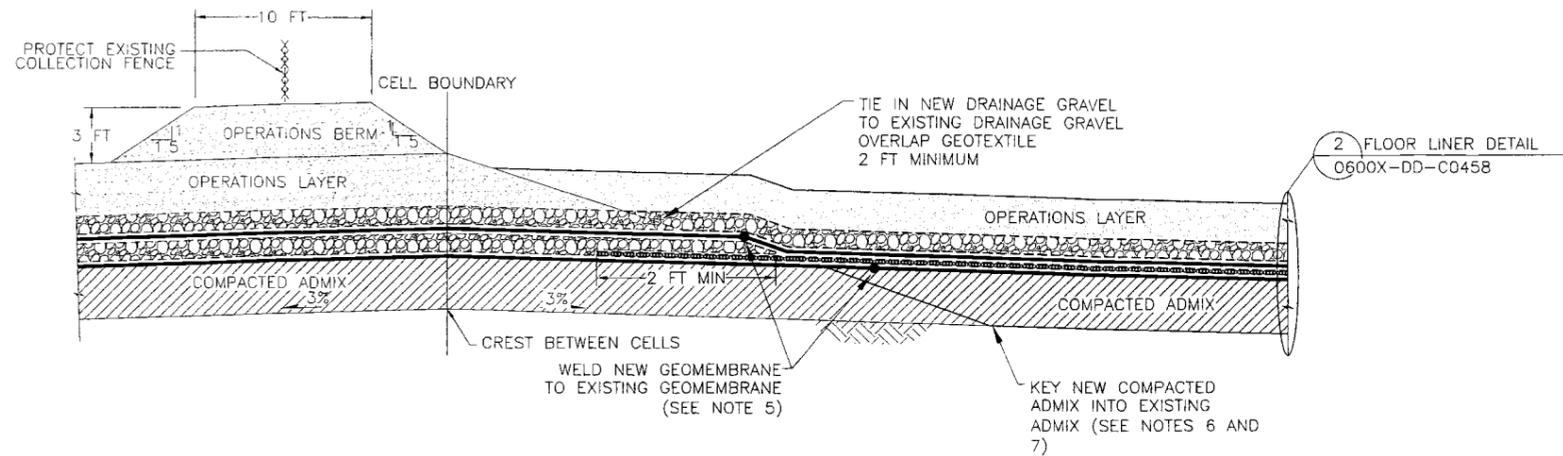
WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
LINER TERMINATION DETAILS - 1

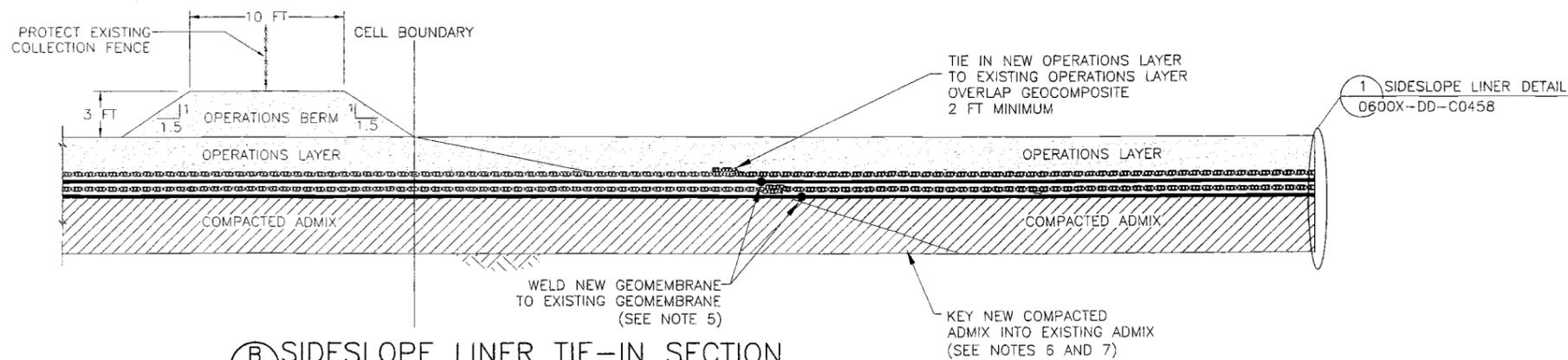
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0462.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0462	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16354 SHT01	600G	0111



A FLOOR LINER TIE-IN SECTION
0600X-DD-C0452



B SIDESLOPE LINER TIE-IN SECTION
0600X-DD-C0452



NOTES

1. LINER SYSTEM COMPONENT THICKNESSES EXAGGERATED FOR CLARITY.
2. REFER TO TECHNICAL SPECIFICATIONS FOR CELL CONSTRUCTION FOR MATERIAL, HANDLING, AND INSTALLATION REQUIREMENTS.
3. FOR LINER TIE-IN, REMOVE ALL DAMAGED, DETERIORATED, OR OTHERWISE UNSATISFACTORY EXISTING GEOSYNTHETIC MATERIALS TO THE SATISFACTION OF THE CONTRACTOR.
4. JOIN GEOSYNTHETIC MATERIALS BETWEEN EXISTING AND NEW LINER SECTIONS USING STANDARD METHODS DESCRIBED IN TECHNICAL SPECIFICATIONS, EXCEPT AS NOTED.
5. JOIN NEW AND EXISTING GEOMEMBRANES WITH WEDGE WELDS.
6. FOR LINER TIE-IN, REMOVE ANY CRACKED OR OTHERWISE UNSUITABLE EXISTING ADMIX TO THE SATISFACTION OF THE CONTRACTOR.
7. SEAM BETWEEN NEW AND EXISTING ADMIX SHALL BE 3H:1V (TYPICAL) AND NO STEEPER THAN 2.75H:1V.
8. ALL LAYERS OF NEW LINER SYSTEM SHALL BE CONTINUOUS WITH CORRESPONDING LAYERS IN EXISTING LINER.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
1	Work may proceed.		
2	Review and resident. Work may proceed prior to resubmission.		
3	Review and resident. Work may proceed prior to resubmission subject to resolution of indicated comments.		
4	Review and resident. Work may not proceed.		
5	Permittee to proceed not required.		

Permittee to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "hold" placed on the contract.

DATE	11-23-2009
BY	W.A. B...
DOCUMENT NUMBER	05-014-037

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DOCUMENT CONTROL *De 11/24/09*

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	DRG/ENGR	ENGR/CHK	SYS ENGR	PROJ ENGR
	11/23/09	ISSUED FOR AWARD						

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

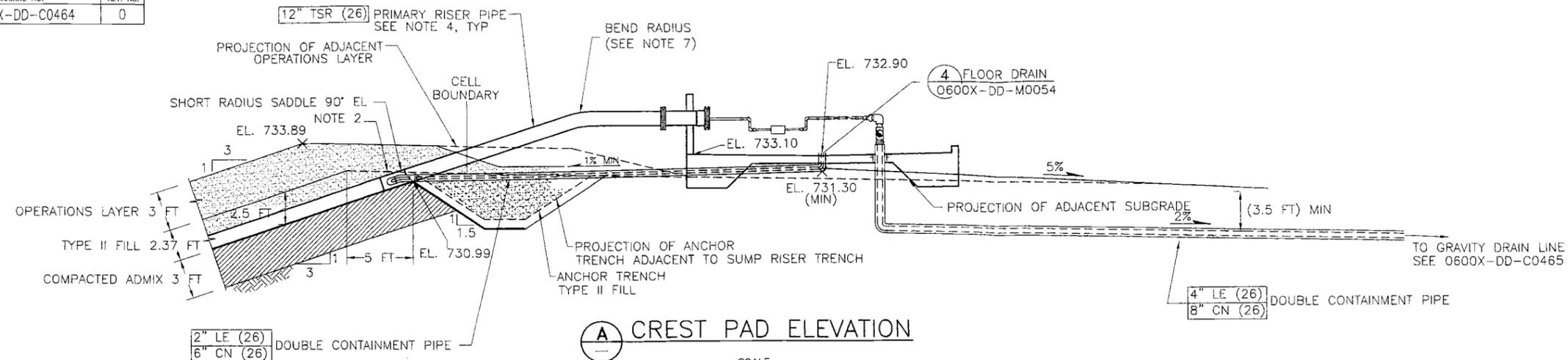
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
LINER TERMINATION DETAILS - 2

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0463.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0463	0

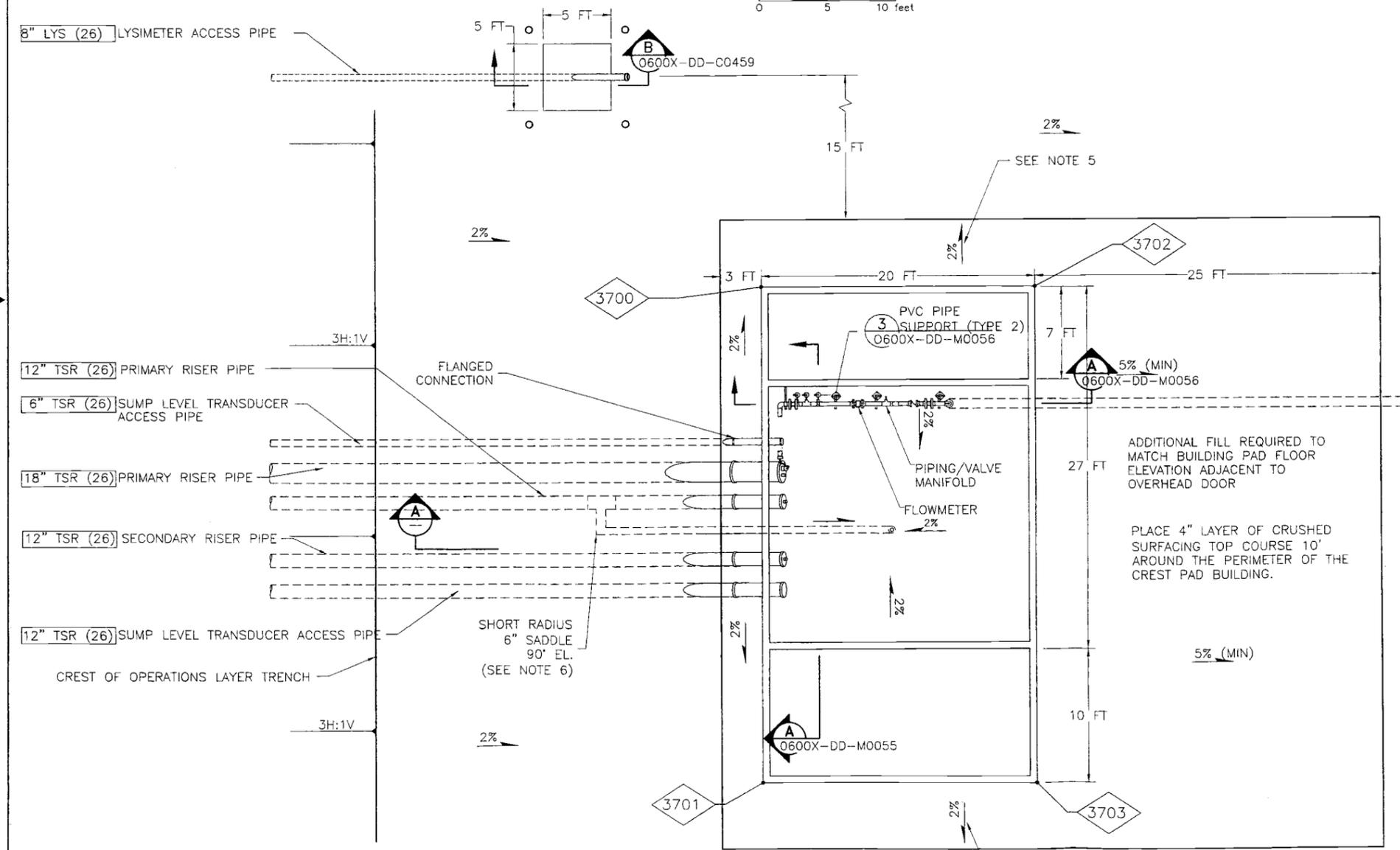
RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16355 SHT01	600G	0111

DRAWING NO. 0600X-DD-C0464
REV. NO. 0



(A) CREST PAD ELEVATION

SCALE
0 5 10 feet



(1) CREST PAD PLAN
0600X-DD-C0452,C0453

SCALE
0 5 10 feet

NOTES

1. CREST PAD BUILDING, PIPE SUPPORTS, AND JUNCTION BOXES NOT SHOWN.
2. WELD PRIMARY GEOMEMBRANE TO SECONDARY RISER PIPES ALL AROUND AT PENETRATION. BOOT MAY BE USED SUBJECT TO APPROVAL BY CONTRACTOR
3. CREST PAD PLAN IS TYPICAL FOR CELLS 9 AND 10.
4. HDPE FUSION BUTT WELD JOINTS SHALL NOT BE MADE ABOVE NON-LINED AREA AT CREST PAD BUILDING TRANSITIONS, EXCEPT FOR FLANGED CONNECTIONS.
5. SLOPE 2% TO BLEND BACK INTO SURROUNDING GRADE.
6. INSTALL SHORT RADIUS 90° EL. TO INSTALL DRAIN LINE FROM CREST PAD BUILDING NEXT TO 12" PRIMARY RISER PIPE.
7. RISER PIPE BEND RADIUS SHALL NOT BE LESS THAN ALLOWED BY MANUFACTURER TO MAINTAIN REQUIRED CENTERLINE ABOVE CREST PAD BUILDING FLOOR AS SHOWN ON DRAWING 0600X-DD-M0055.

CREST PAD BUILDING COORDINATES		
POINT NO.	NORTHING	EASTING
3700	441,761.09	1,867,987.00
3701	441,761.09	1,868,024.00
3702	441,781.09	1,867,987.00
3703	441,781.09	1,868,024.00
3700	441,761.09	1,868,487.00
3701	441,761.09	1,868,524.00
3702	441,781.09	1,868,487.00
3703	441,781.09	1,868,524.00



DOCUMENT CONTROL *11/24/09*

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NOV 23 2009
WCH - DOCUMENT CONTROL

WASHINGTON CLOSURE HANFORD		JOB NO. 14655
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP		
<input type="checkbox"/> Work not provided	<input type="checkbox"/> Review and resubmit. Work may proceed prior to resubmission	
<input type="checkbox"/> Review and resubmit. Work may proceed prior to resubmission subject to resolution of all design comments	<input type="checkbox"/> Review and resubmit. Work may not proceed	
<input type="checkbox"/> Review and resubmit. Work may not proceed	<input type="checkbox"/> Returned to provider (no) required	
Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contractual obligations or release any "holds" placed on the contract.		
DATE	BY	REMARKS
11-23-2009	W.A. F...	
DOCUMENT NUMBER		038
JOB NO.		14655

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	DRG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
0	11/23/09	ISSUED FOR AWARD						

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

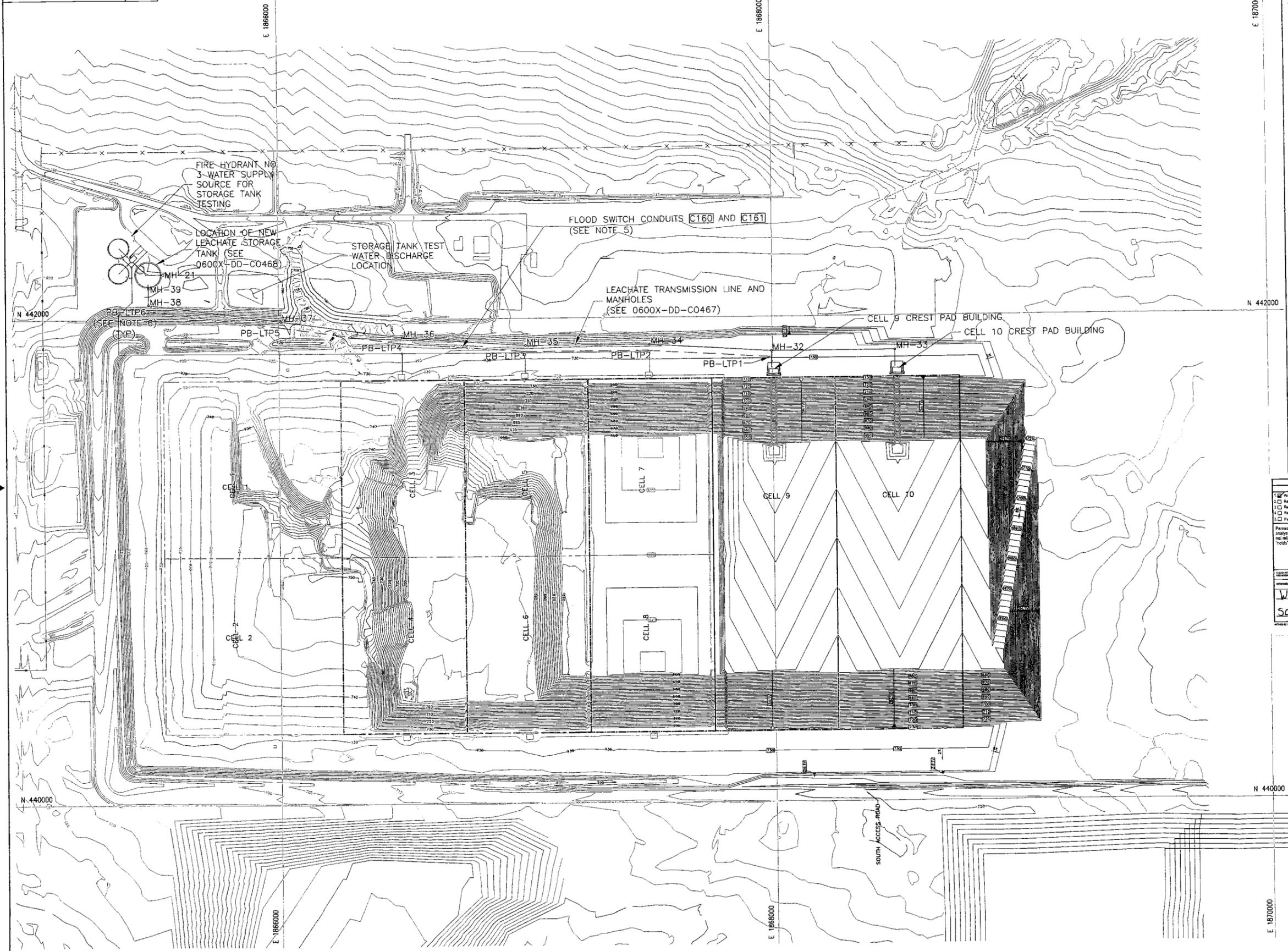
WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9-10
CREST PAD PLAN AND ELEVATION

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0464.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0464	0

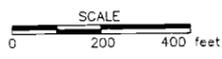
RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16356 SHT01	600G	0105

DRAWING NO. 0600X-DD-C0465
REV. NO. 0



NOTES

1. TOPOGRAPHY IN THE VICINITY OF THE PROJECT IS FROM FIELD SURVEY FROM ROGERS SURVEYING, INC., JULY 2006.
2. TOPOGRAPHY IS SHOWN IN FEET ABOVE SEA LEVEL.
3. SUBCONTRACTOR SHALL VERIFY ALL CONTOURS AND ELEVATIONS THAT EFFECT CONSTRUCTION ACTIVITIES.
4. SURVEY DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83 (91)
5. MANHOLES MH-34 THROUGH MH-39 SHALL HAVE FLOOD ALARMS. CONDUIT FOR FLOOD ALARM POWER AND COMMUNICATION SHALL BE SUPPLIED FROM CELL 9 CREST PAD BUILDING. PULLBOXES SHALL BE INSTALLED ADJACENT TO MANHOLES. SEE DWG NO. 0600X-DD-E0220.
6. ALL PULL BOXES SHALL BE 30" W x 48" L x 40" D (INSIDE DIMENSIONS) UNLESS OTHERWISE NOTED. SEE DWG NO. 1 TYPICAL PULLBOX 0600X-DD-E0218



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DOCUMENT CONTROL *De 11/24/09*

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS SHEET			
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<input type="checkbox"/>	Review and approve. Work may proceed prior to construction subject to resolution of selected comments.	<input type="checkbox"/>	Review and approve. Work may not proceed.
<input type="checkbox"/>	Particulars to proceed not required.	<input type="checkbox"/>	Particulars to proceed not required.
Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve the supplier/subcontractor from full compliance with contractual obligations or release any "hold" placed on the contract.			
DATE	BY	DATE	BY
11-23-2009	W.A. Boos	11-23-2009	W.A. Boos
S06X524 R00CN03-05-011-039		S06X524 R00CN03-05-011-039	



REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	GRG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
1	11/23/09	ISSUED FOR AWARD	W.A. Boos					

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS, LLC DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
LEACHATE TRANSMISSION PIPELINE & TANK

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0465.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0465	0

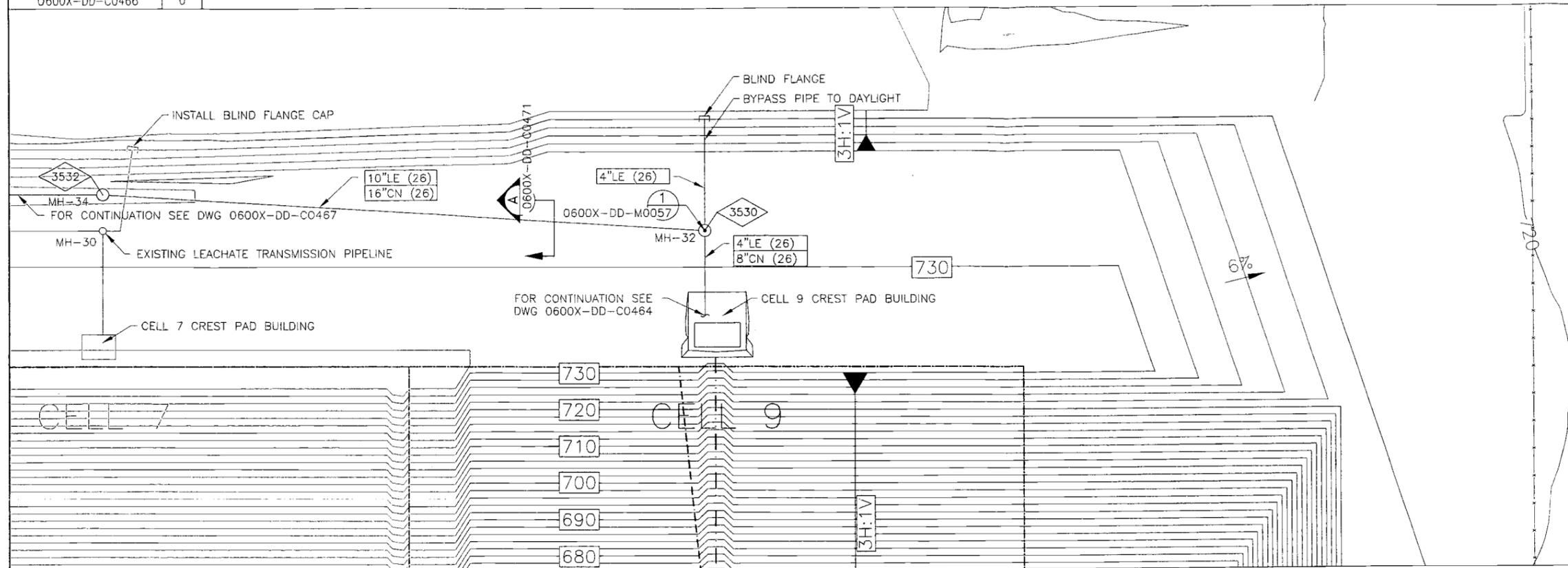
RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16357 SHT01	600G	0110

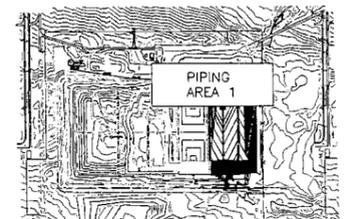
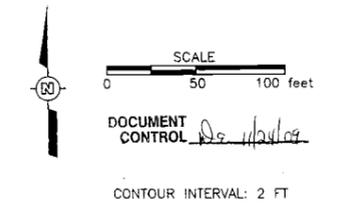


22X_WCH-038896 09/05

1. SURVEY DATUM:
VERTICAL NAVD 88
HORIZONTAL NAD 83 (91)
2. SEE DRAWING 0600X-DD-M0053 FOR PIPING MATERIAL DESIGNATION.
3. BYPASS PIPE SHALL EXTEND 12" OUT FROM THE GROUND SURFACE.
4. SEE DRAWING 0600X-DD-G0047 FOR COORDINATE INFORMATION.

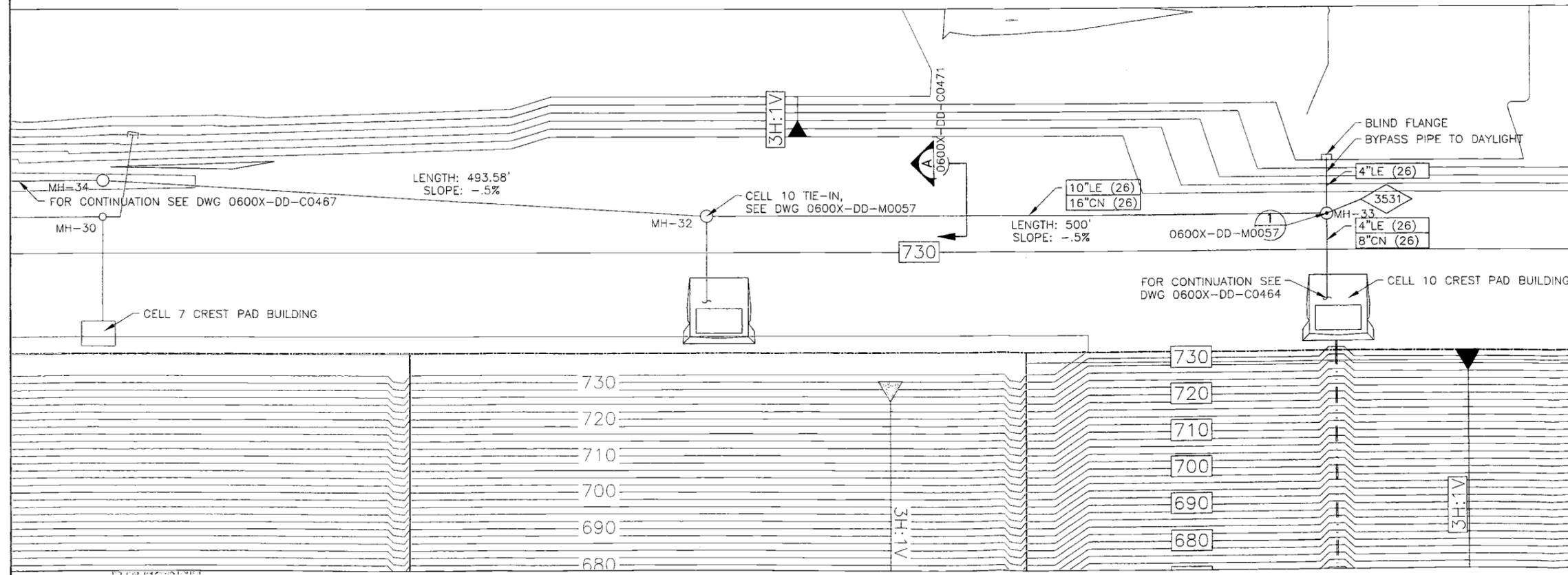


PIPING AREA 1 - CELL 9 TIE-IN



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KEY PLAN



PIPING AREA 1 - CELL 10 TIE-IN

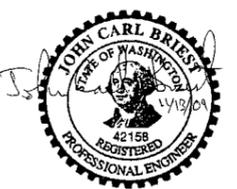
WASHINGTON CLOSURE HANFORD SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed.
2. Review and rework. Work may proceed after re-submission.
3. Review and rework. Work may proceed after re-submission subject to resolution of indicated comments.
4. Review and rework. Work may not proceed.
5. Permission to proceed not required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contractual obligations or resolve any "rules" placed on the contract.

DATE	DESCRIPTION	BY	DATE	DESCRIPTION	BY
11-23-2009	ISSUED FOR AWARD	WCH			

WA - F...
S06X5249000103-05014-040



REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
	11/23/09	ISSUED FOR AWARD						

SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
YARD PIPING PLAN - CELLS 9 & 10

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0466.DWG

RECORD INFORMATION

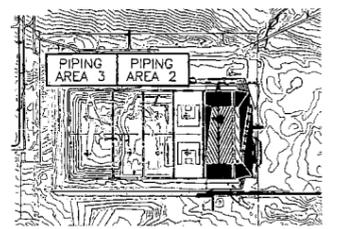
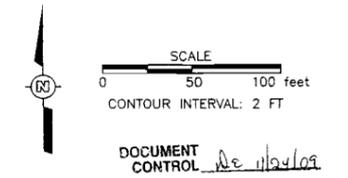
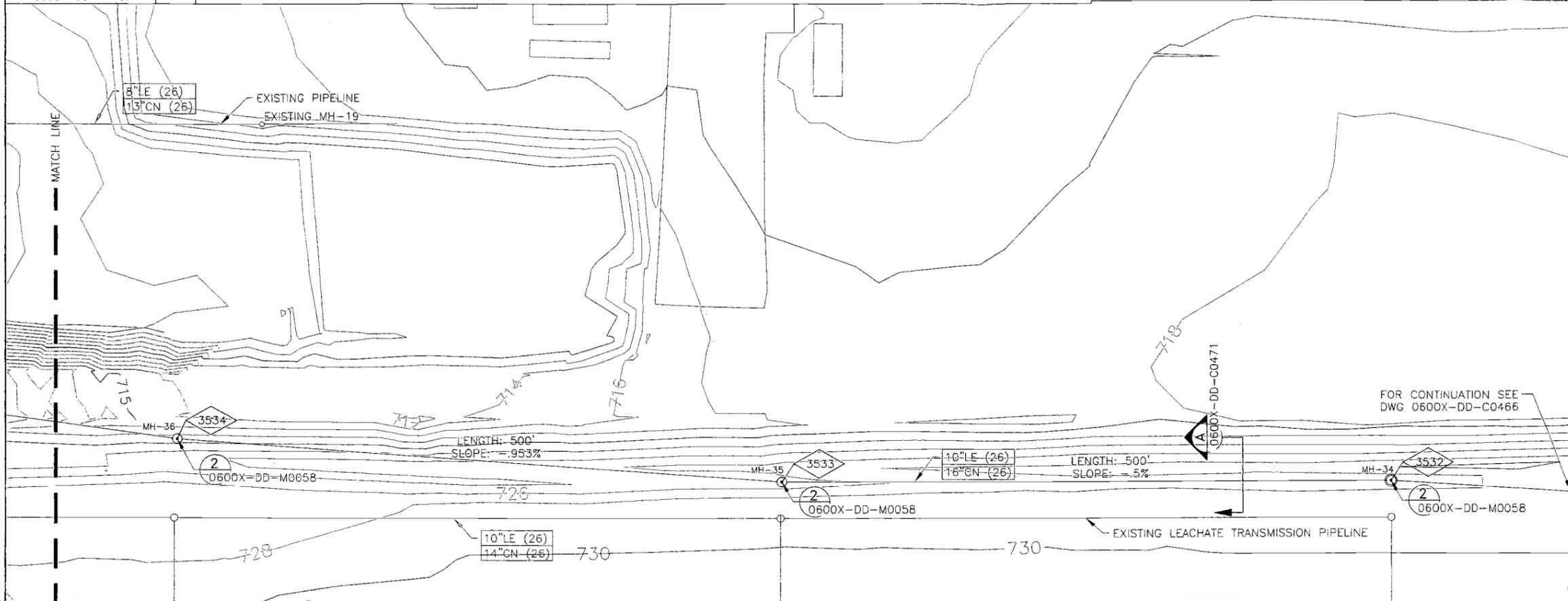
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16358 SHT01	600G	0105

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0466	0

DRAWING NO. 0600X-DD-C0467
REV. NO. 0

NOTES

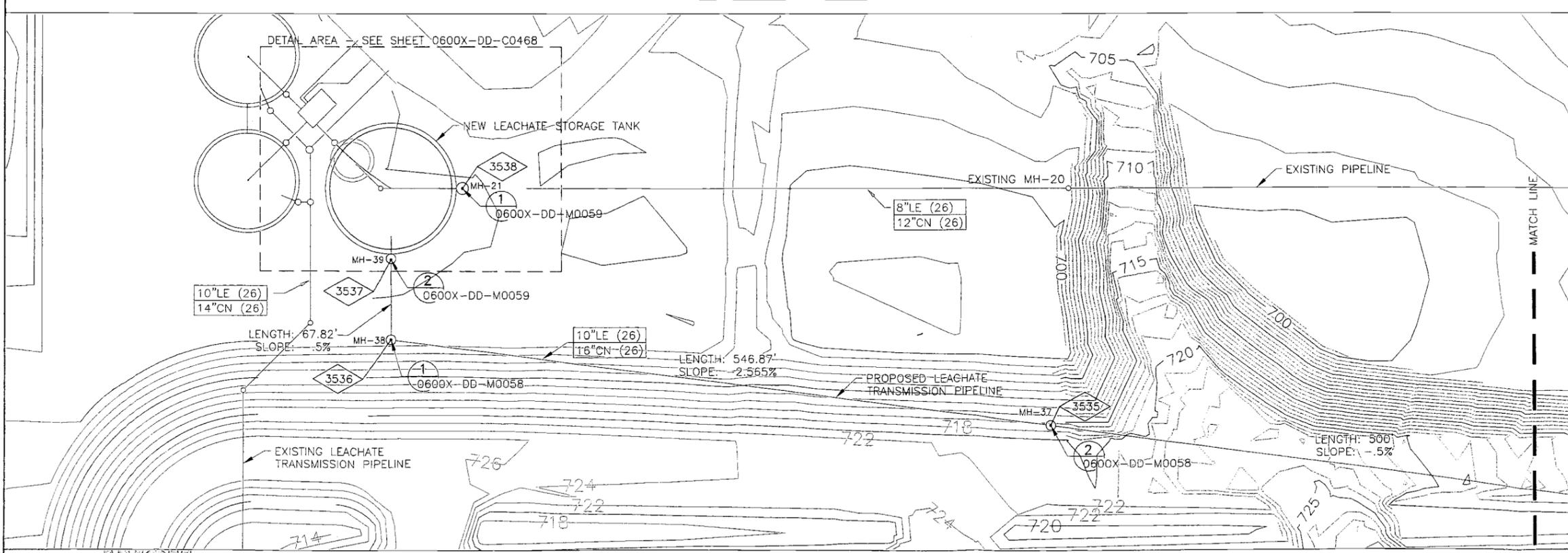
1. SURVEY DATUM:
VERTICAL NAVD 88
HORIZONTAL NAD 83 (91)
2. SEE DRAWING 0600X-DD-M0053 FOR PIPING MATERIAL DESIGNATION.
3. SEE DRAWING 0600X-DD-G0047 FOR COORDINATE INFORMATION.



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PIPING AREA 2



WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPERVISOR/CONTRACTOR DOCUMENT STATUS STAMP			
<input type="checkbox"/>	1. Work may proceed.	<input type="checkbox"/>	2. Review and resubmit. Work may proceed prior to resubmission.
<input type="checkbox"/>	3. Review and resubmit. Work may proceed prior to resubmission subject to resolution of awarded contractor.	<input type="checkbox"/>	4. Review and resubmit. Work may not proceed.
<input type="checkbox"/>	5. Review and resubmit. Work may not proceed.	<input type="checkbox"/>	6. Permit to be ground not required.
Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contractual obligations or release any "hold" status on the contract.			
DATE	BY	DATE	BY
11-23-2009	W.A. Boos	11-23-2009	W.A. Boos
DOCUMENT ID NUMBER: 0600X-DD-C0467		SCALE: AS SHOWN	



REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENG'G	ENG'G	SYS ENGR	PROJ ENGR

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
YARD PIPING PLAN - TRANSMISSION PIPELINE

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0467.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0467	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16359 SHT01	600G	0105

River Corridor Closure CONTRACT
Dedicated To Safety Excellence

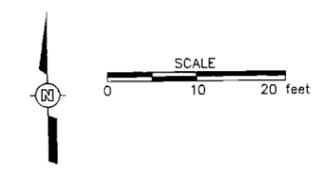
PIPING AREA 3

SCALE: AS SHOWN

DRAWING NO. 0600X-DD-C0468
REV. NO. 0

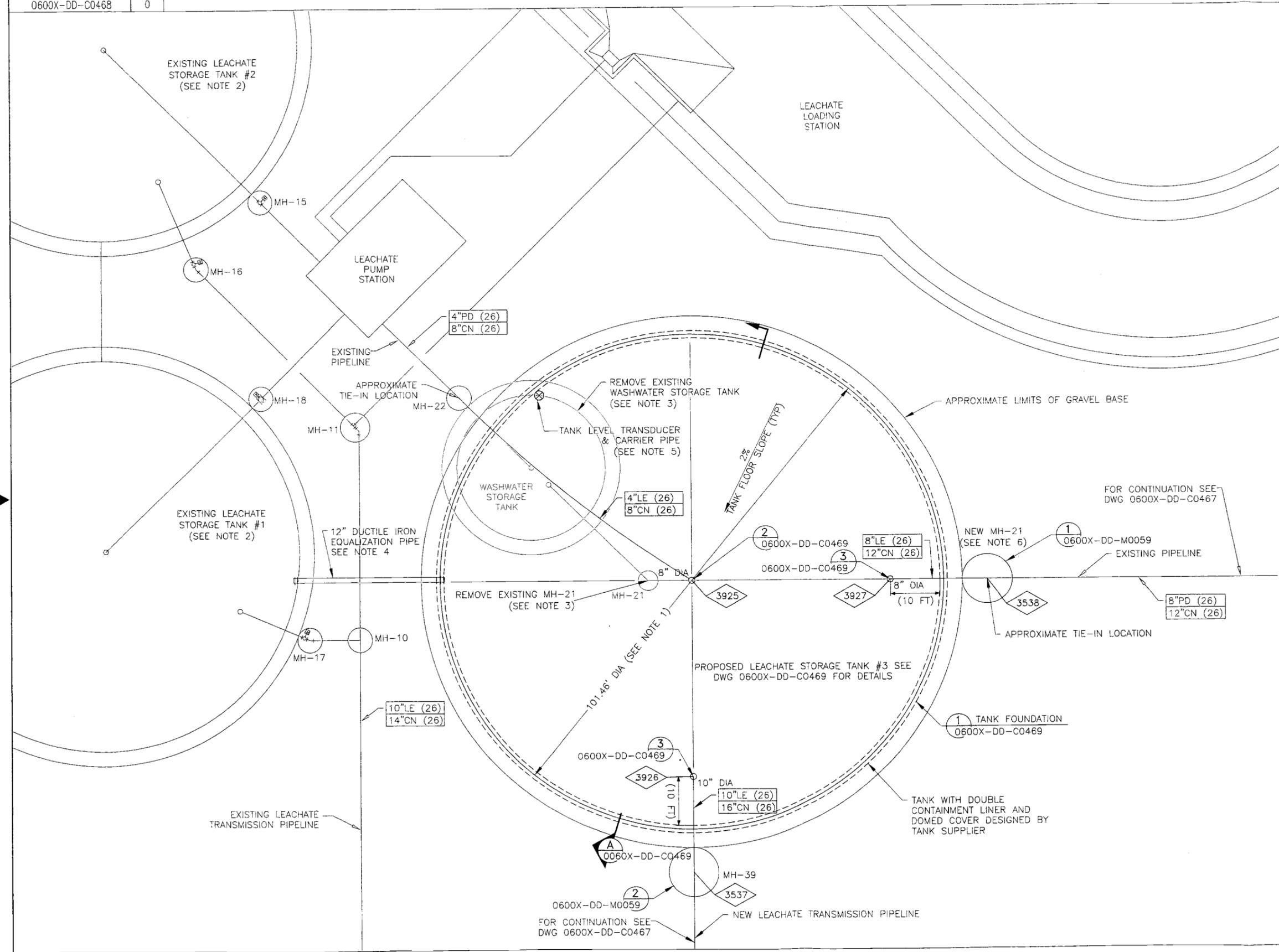
NOTES

- DIAMETER FOR THE TANK REFERS TO ϕ OF THE TANK SHELL CORRUGATIONS.
- DOMED COVERS SHALL BE INSTALLED ON EXISTING LEACHATE STORAGE TANK #1 AND EXISTING LEACHATE STORAGE TANK #2. THE EXISTING FLOATING COVERS ON THE LEACHATE TANKS SHALL BE REMOVED, THE TANKS CLEANED, AND THE TANK LINERS INSPECTED PRIOR TO INSTALLATION OF THE DOMED COVERS.
- THE EXISTING WASH WATER STORAGE TANK, FLOATING COVERS, EXISTING MANHOLE 21, PIPING, AND ASSOCIATED EQUIPMENT SHALL BE REMOVED AND DISPOSED IN ERDF.
- EQUALIZATION PIPELINE BETWEEN TANKS SHALL BE INSTALLED AT THE SAME ELEVATION AS THE EQUALIZATION PIPELINE BETWEEN TANKS #1 AND #2. TANK PENETRATIONS AND PIPE SUPPORTS FOR THE EQUALIZATION PIPELINE SHALL BE DESIGNED BY THE SUBCONTRACTOR.
- TANK LEVEL MEASUREMENT SYSTEM SHALL BE LOCATED TO UTILIZE THE EXISTING WASH WATER TANK CONDUIT AND CONDUCTORS TO THE LEACHATE PUMP STATION.
- CONNECT THE NEW FLOOD SWITCH IN NEW MH-21 TO THE EXISTING CONDUIT AND CONDUCTORS ROUTED TO THE LEACHATE PUMP STATION.



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NOV 23 2009
WCH - DOCUMENT CONTROL
DOCUMENT CONTROL *De Vito/lor*

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP			
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<input type="checkbox"/>	Review and rework. Work may proceed upon re-submission subject to resolution of inherent concerns.	<input type="checkbox"/>	Review and rework. Work may not proceed.
<input type="checkbox"/>	Review and rework. Work may not proceed.	<input type="checkbox"/>	Review and rework. Work may not proceed.
<input type="checkbox"/>	Review and rework. Work may not proceed.	<input type="checkbox"/>	Review and rework. Work may not proceed.
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or prepared by the supplier/subcontractor and does not relieve the supplier/subcontractor from full compliance with contractual obligations or release any "hold" placed on the contract.			
DATE	BY	DATE	BY
11/23/09	W.A. De Vito	11/23/09	W.A. De Vito
DOCUMENT ID NUMBER: 506524A00CN03-05-014-043		SUBMITAL	



PIPING AREA 4

REV.	DATE	DESCRIPTION	DRAWN BY	CHK	ENGR	DATE	CHK	ENGR
1	11/13/09	ISSUED FOR AWARD	W.A. De Vito	W.A. De Vito	W.A. De Vito	11/13/09	W.A. De Vito	W.A. De Vito

SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
YARD PIPING PLAN - LEACHATE STORAGE TANK AREA

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDC0468.DWG
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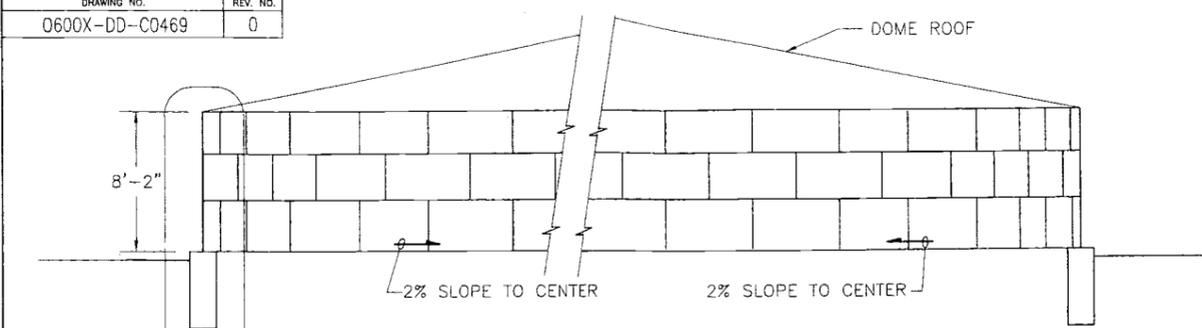
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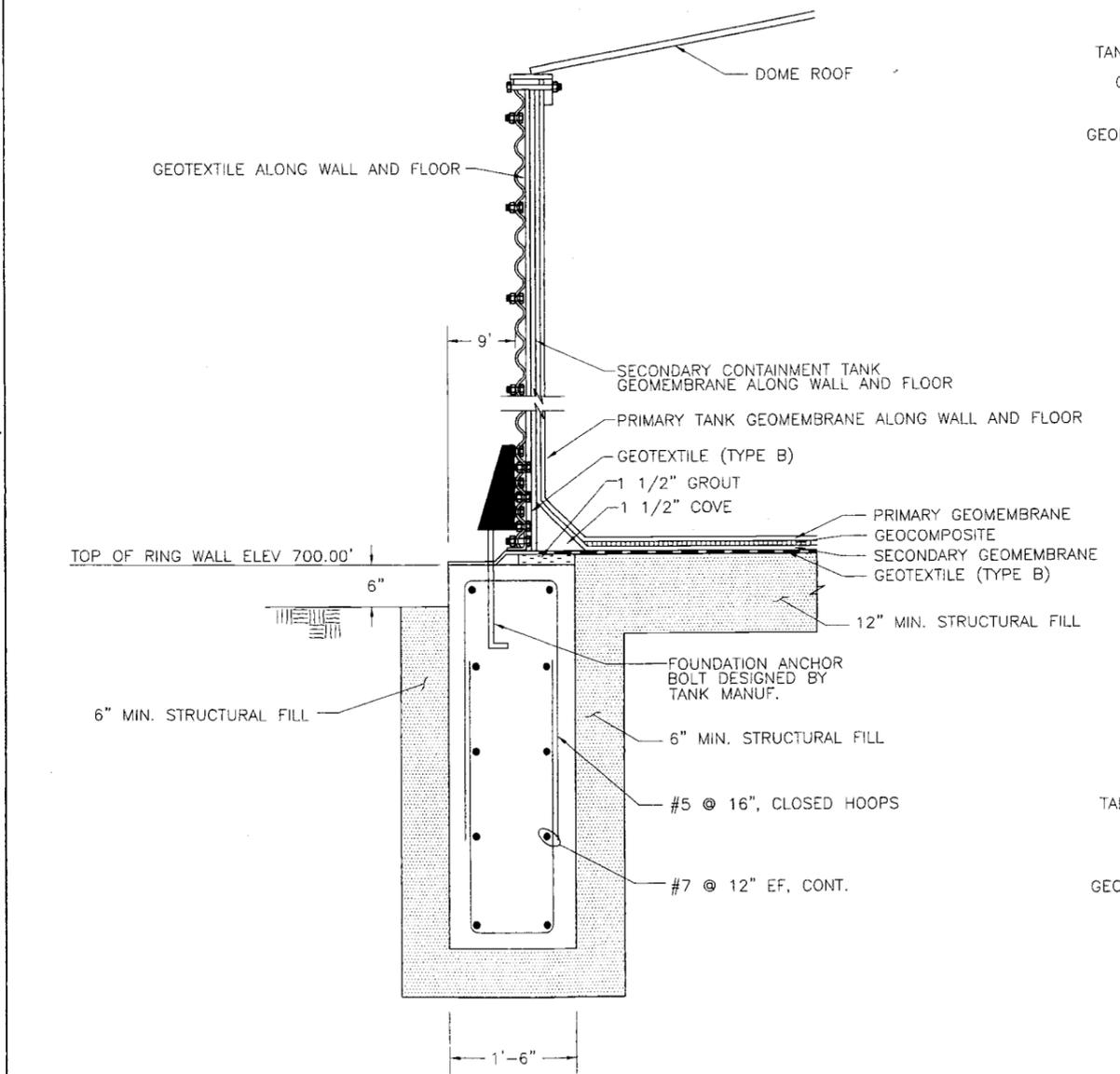
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H-6-16360 SHT01	600G	0105

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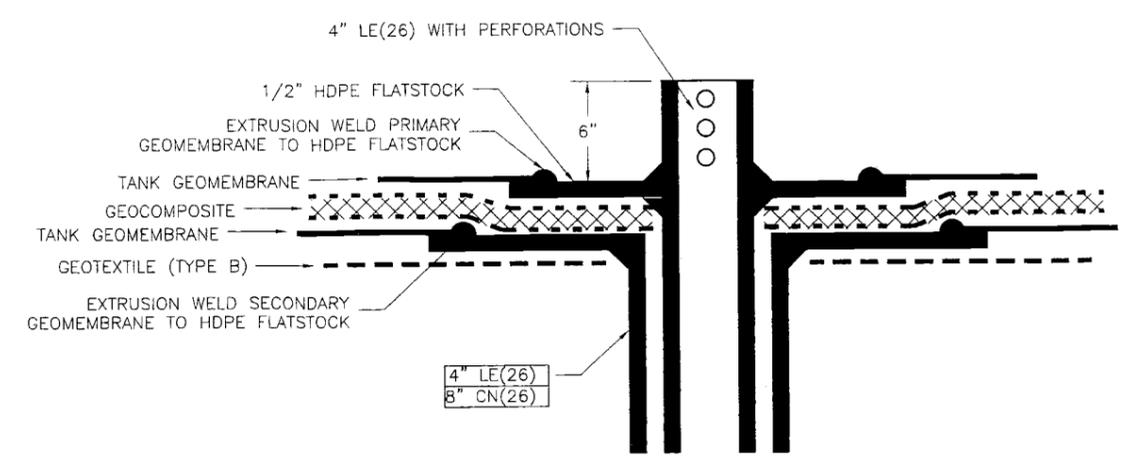
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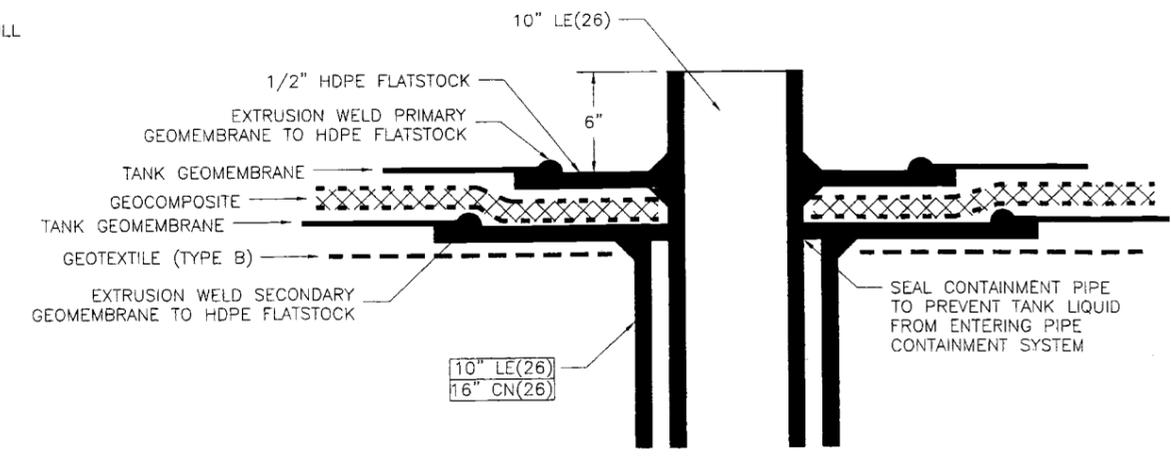
SECTION A
0600X-DD-C0468



1 TANK FOUNDATION DETAIL
0600X-DD-C0468 NTS



2 TANK OUTLET FLOOR PENETRATION DETAIL
0600X-DD-C0468 NTS



3 TANK INLET FLOOR PENETRATION DETAIL
0600X-DD-C0468 NTS

NOTES

1. CONCRETE STRENGTH: MIN 4000 PSI COMPRESSIVE (CLASS 40) @ 28 DAYS.
2. REINFORCING STEEL: ASTM 615, GRADE 60.
3. TANK PENETRATIONS SHALL BE SHOP FABRICATED.

WASHINGTON CLOSURE HANFORD JOB NO 14655
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed.
2. Review and rework. Work may proceed prior to rework.
3. Review and rework. Work may proceed prior to rework subject to revision of indicated comments.
4. Review and rework. Work may not proceed.
5. Permission to proceed not required.

Permittee by process does not constitute acceptance or approval of design details, calculations, materials, test methods, or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contractual obligations or release any "hold" placed on the contract.

NO.	DATE	BY	DESCRIPTION
1	11-23-2009	W.A. DeLong	ISSUED FOR AWARD

W.A. DeLong 11-23-2009
DOCUMENT NUMBER: 0600X-DD-C0468-043
SCOPE: RICHLAND, WASHINGTON

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DOCUMENT CONTROL *See below*

MY STAMP AND SEAL APPLY TO THOSE CHANGES MADE IN REVISION(S) 0. THE ORIGINAL DESIGN WAS NOT PREPARED UNDER MY DIRECTION.

THIS DRAWING HAS BEEN PREPARED IN PART ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS. THE ENGINEER IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.



REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENGR/ENGR	SYE ENGR	PRJ ENGR
1	11/23/09	ISSUED FOR AWARD	WCH	WCH	WCH	WCH	WCH

SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS LLC DENVER, CO

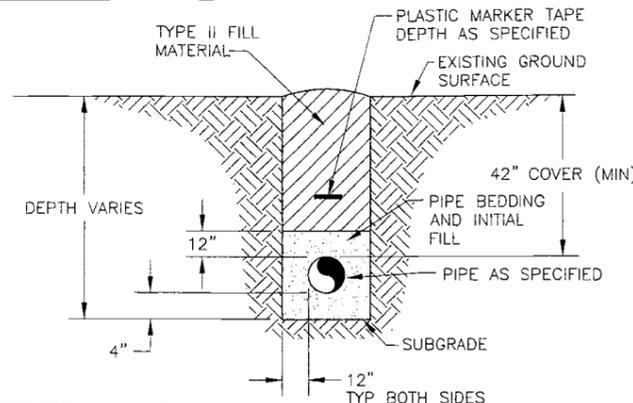
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
LEACHATE STORAGE TANK DETAILS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0469.DWG

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ERDF	0600X-DD-C0469	0

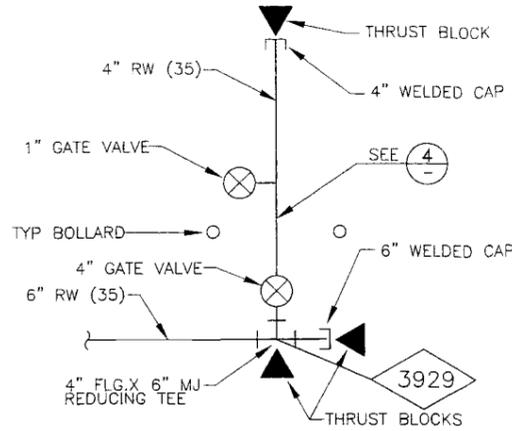
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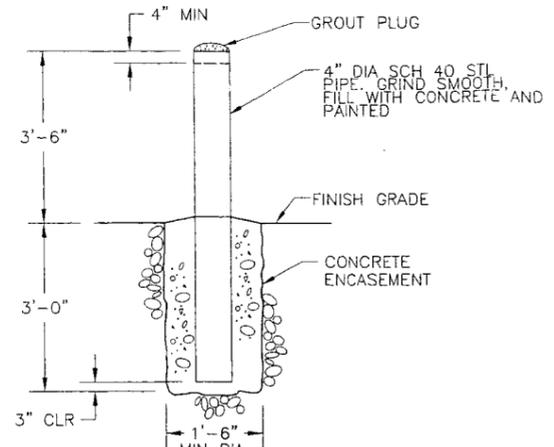


NOTE:
1. SLOPE TRENCH WALLS AS REQD TO MEET OSHA REQUIREMENTS SEE GENERAL NOTE 2

A TYPICAL TRENCH SECTION
0600X-DD-C0453, C0466, C0467 NTS



1 FILL STATION SERVICE TEE
0600X-DD-C0453

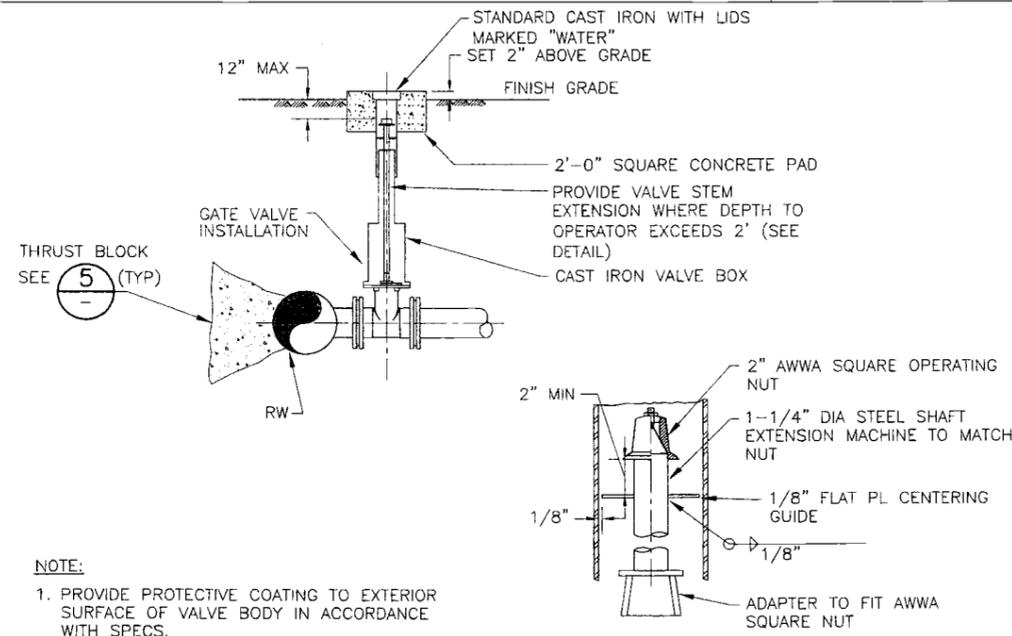


2 BOLLARD DETAIL
0600X-DD-C0459, C0471 NTS

- NOTES
- THRUST BLOCKS REQUIRED AT ALL BENDS AND TEES.
 - SUBCONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ADEQUATE TRENCH SIDE SLOPES FOR CONSTRUCTION AND SAFETY PURPOSES IN ACCORDANCE WITH 29 CFR 1926, SUBPART P. EXISTING SOIL TYPE IS EXPECTED TO BE NO GREATER THAN TYPE C.
 - SUBCONTRACTOR SHALL PROTECT AIR MONITORING STATIONS.
 - SUBCONTRACTOR SHALL NOT DISRUPT CURRENT ERDF OPERATIONS. SUBCONTRACTOR SHALL COORDINATE ACTIVITIES WITH CONTRACTOR. CURRENT ERDF OPERATING FACILITIES MUST BE ACCESSIBLE BY ERDF OPERATIONS AT ALL TIMES UNLESS AUTHORIZED OTHERWISE BY THE CONTRACTOR.
 - FOR COORDINATE INFORMATION SEE DWG. 0060X-DD-C0047.

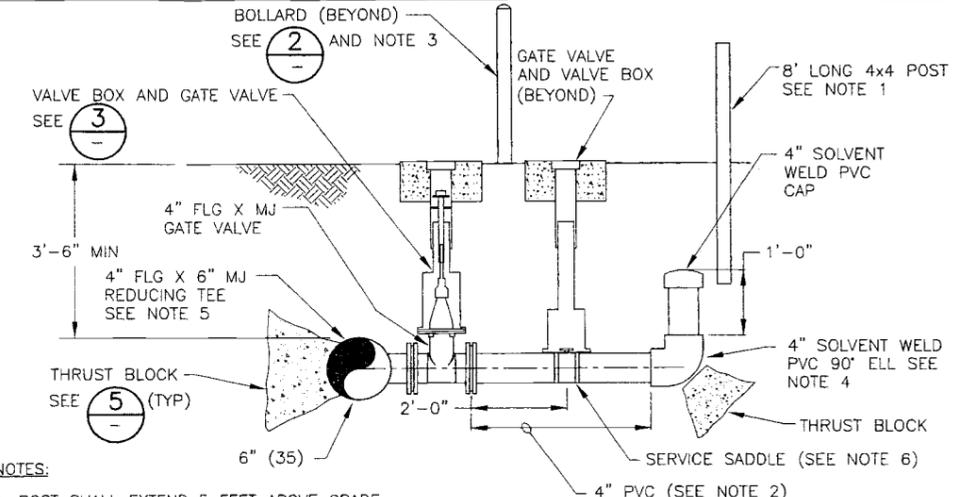
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1	WORK PERFORMED			
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5	REVISIONS			

RECEIVED
NOV 23 2009
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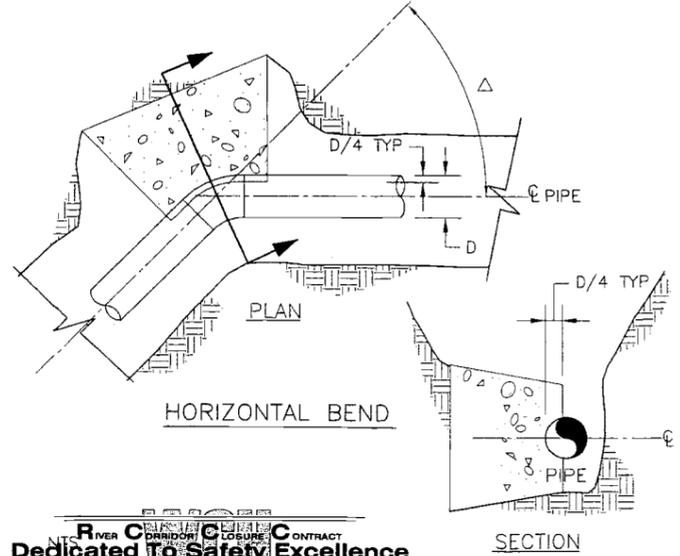
NOTE:
1. PROVIDE PROTECTIVE COATING TO EXTERIOR SURFACE OF VALVE BODY IN ACCORDANCE WITH SPECS.

3 BURIED VALVE INSTALLATION
NTS



- NOTES:
- POST SHALL EXTEND 5 FEET ABOVE GRADE.
 - INSTALL 10 FT OF 4" (35) PVC.
 - INSTALL 2 BOLLARDS, EACH BOLLARD SHALL BE 3'-0" FROM VALVE AND PARALLEL WITH 6" PVC.
 - AT 90° ELL, INSTALL FITTINGS NECESSARY TO TRANSITION FROM C900 PVC TO 4" SOLVENT WELD PVC.
 - INSTALL 6" MJ CAP AND THRUST BLOCK 5'-0" SOUTH OF REDUCING TEE.
 - INSTALL 1" GATE VALVE WITH CROSS HANDLE OPERATOR, 1" DIA X 12" LONG GSP AND 2 CUBIC FEET OF DRAIN GRAVEL (NOT SHOWN FOR CLARITY).

4 FILL STATION/PUG MILL SERVICE
NTS



BEARING AREA OF THRUST BLOCKS IN SQUARE FEET
HORIZONTAL BENDS

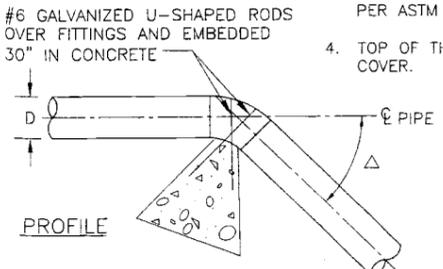
D PIPE SIZE INCHES	TEST PRESSURE PSI	BEND				TEE OR CAP
		90°	45°	22.5°	11.25°	
4"	150	2.9	1.6	1.0	1.0	2.1
6"	150	6.1	3.3	1.7	1.0	4.3
12"	150	22.2	12.0	6.1	3.1	15.7

VOLUME OF THRUST BLOCK IN CUBIC YARDS
VERTICAL BENDS

D PIPE SIZE INCHES	BEND			
	90°	45°	22.5°	11.25°
4"	1.9	1.8	1.8	1.8
6"	3.9	2.1	1.8	1.8
12"	14.4	7.8	4.0	2.0

5 TYPICAL THRUST BLOCK DETAILS
NTS

- NOTES:
- THRUST BLOCKS SHALL BE POURED AGAINST EXCAVATED SOILS, AND ANY LOOSE SOILS OVEREXCAVATED AND REPLACED WITH ADDITIONAL CONCRETE MASS.
 - THRUST BLOCKS REQUIRED AT ALL BENDS, TEES, CAPS, AND HYDRANTS.
 - WHERE THRUST BLOCKS CANNOT BE FOUNDED AGAINST UNDISTURBED MATERIALS, BACKFILL AROUND THRUST BLOCKS SHALL BE BEDDING MATERIAL COMPACTED TO 95% PER ASTM 1557.
 - TOP OF THRUST BLOCKS SHALL HAVE MINIMUM 3'-0" OF COVER.



U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

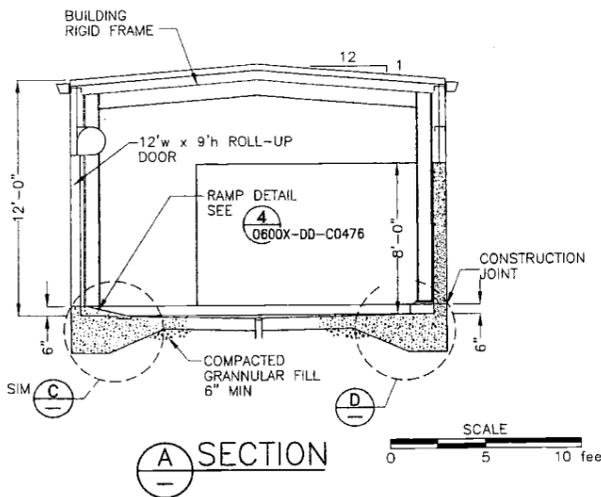
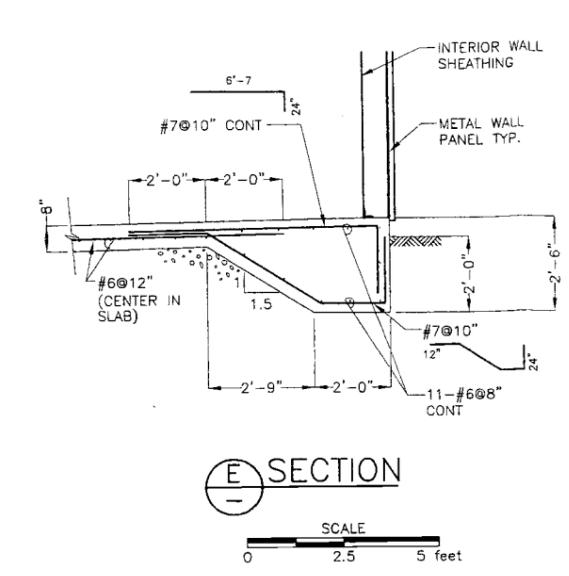
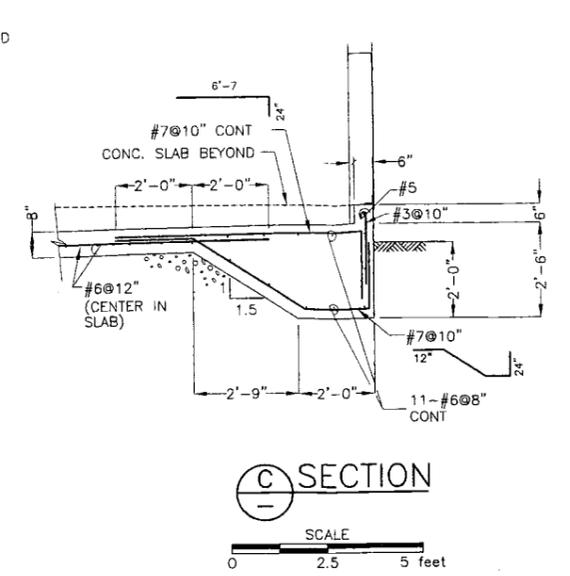
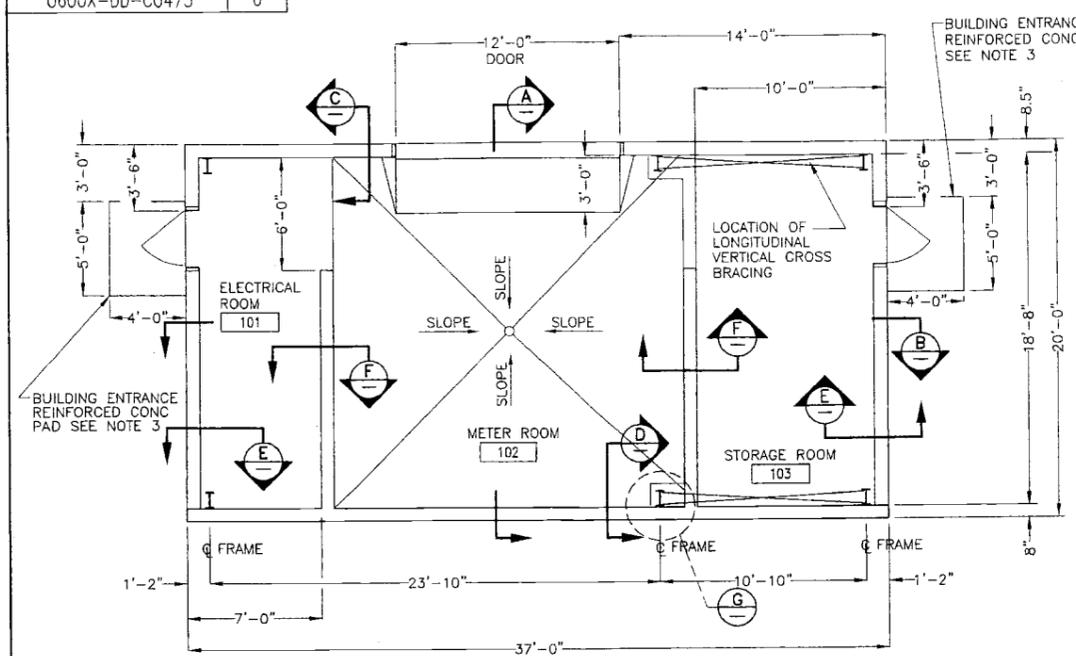
WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
YARD PIPING WATERLINE EXTENSION DETAILS

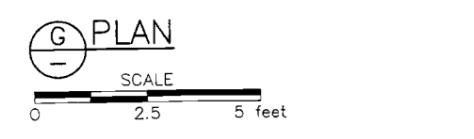
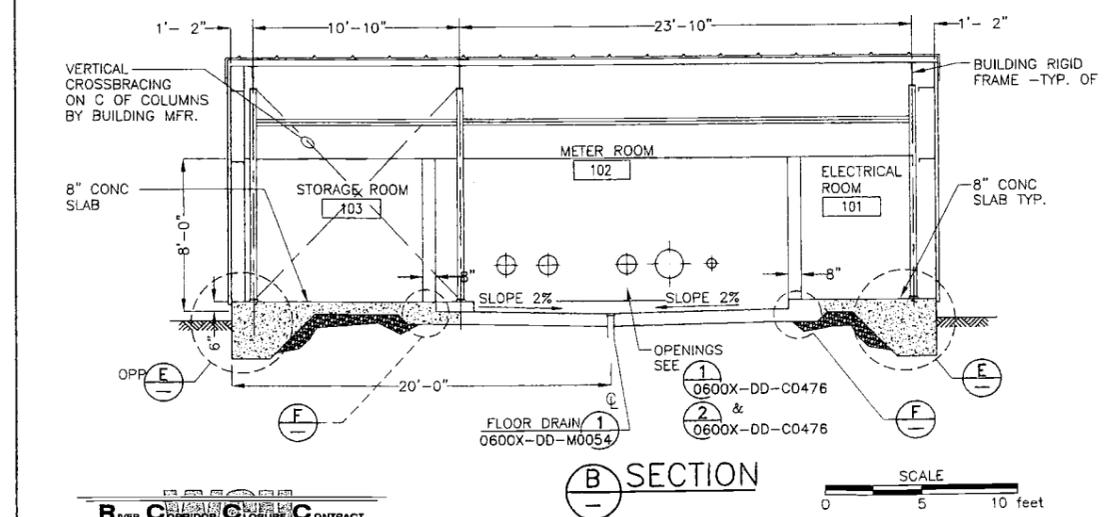
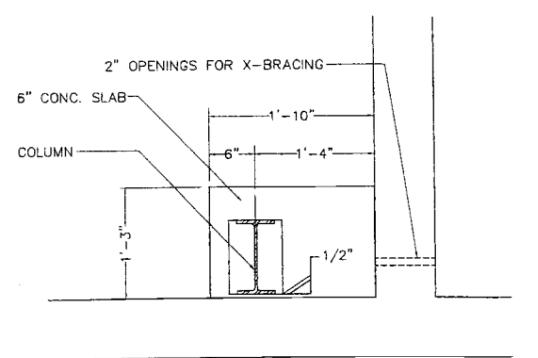
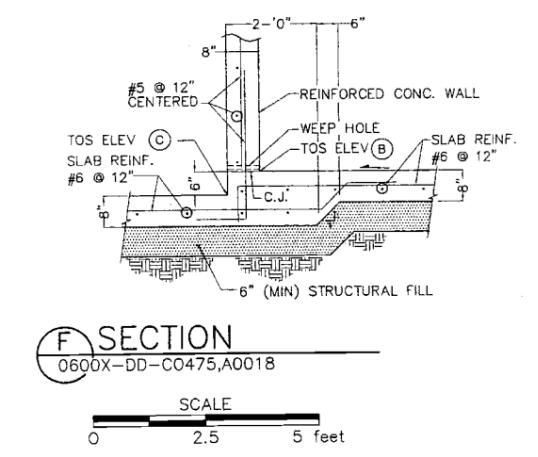
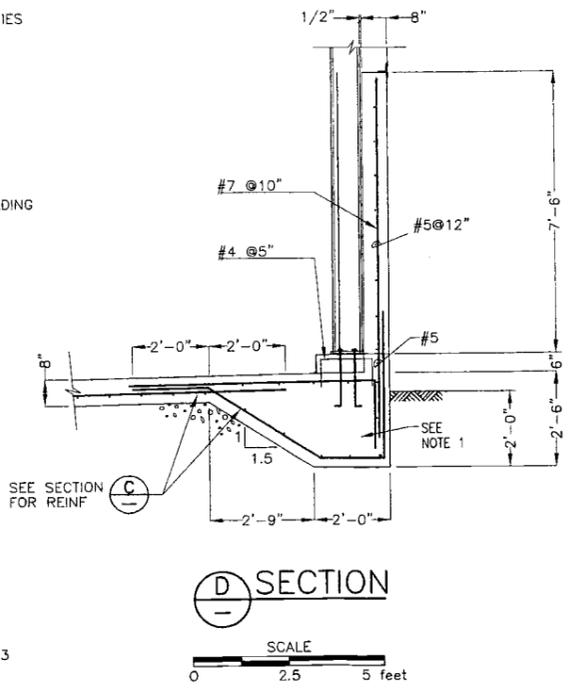
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0471.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0471	0



NOTE: BUILDING ORIENTATION VARIES SEE BELOW

CREST PAD BUILDING CELL 9 & 10



NOTES

- BUILDING FRAME ANCHOR BOLTS SHALL BE A MINIMUM OF (4)-3/4" DIA. W/ 90 OR 180 DEGREE HOOK EMBEDDED 15". COORDINATE WITH BUILDING SUPPLIER FOR BOLT NUMBER AND LOCATION.
- BUILDING TYPICAL (2 PLANS) FOR CELLS 9 & 10.
- BOTH OUTSIDE BUILDING ENTRANCE PADS SHALL BE 6" THICKNESS WITH #4@12" EW CENTERED IN SLAB THICKNESS. PADS SHALL BE SEPARATE FROM MAIN FOUNDATION SLAB. SLOPE PADS 1/4"/FT AWAY FROM DOOR OPENINGS.
- THE INTERIOR CONCRETE SLABS AT DOORWAYS ARE TO BE FINISHED LEVEL, NO SLOPE.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR FOR DOCUMENT STATUS STAMP			
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<input type="checkbox"/>	2	Revised and resubmitted, which may proceed prior to resubmission.	
<input type="checkbox"/>	3	Revised and resubmitted, which may proceed prior to resubmission subject to resolution of indicated comments.	
<input type="checkbox"/>	4	Revised and resubmitted. Work may not proceed.	
<input type="checkbox"/>	5	Permitation is required.	

Permitted to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.

DATE	DESCRIPTION	BY	CHK	DATE	DESCRIPTION	BY	CHK
11-23-2009		W.A. Boos					

W.A. Boos
11-23-2009
SOLXSA4600CN03.05.014-046

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NOV 23 2009
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DOCUMENT CONTROL *De. 11/24/09*

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△	11/13/09	ISSUED FOR AWARD	W.A. Boos	W.A. Boos	N/A	MHF	
REV.	DATE	DESCRIPTION	DRAWN BY	CHK	ENGR	SYS ENGR	PROJ ENGR

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

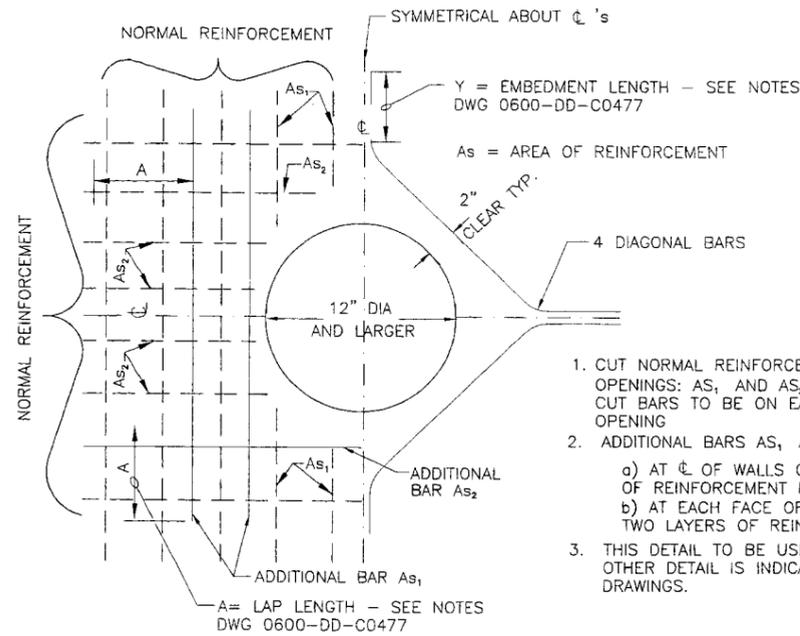
WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
CREST PAD BLDG STRUCTURAL PLANS AND SECTIONS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
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ERDF	0600X-DD-C0475	0

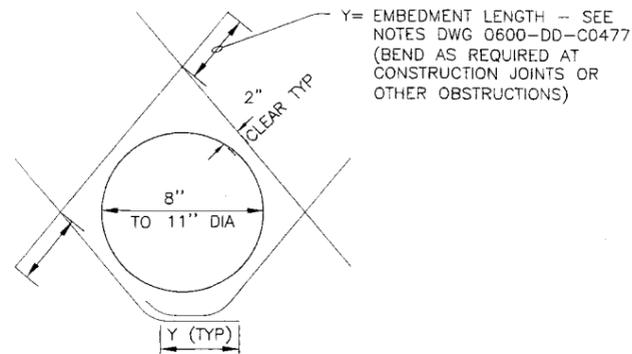
RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16367 SHT01	600G	0901



1. CUT NORMAL REINFORCEMENT AT OPENINGS: AS_1 AND $AS_2 = 1/2$ AREA OF CUT BARS TO BE ON EACH SIDE OF OPENING
2. ADDITIONAL BARS AS_1 AND AS_2 TO BE PLACED:
 - a) AT ϕ OF WALLS OR SLABS WHERE ONE LAYER OF REINFORCEMENT IS PROVIDED
 - b) AT EACH FACE OF WALLS OR SLABS WHERE TWO LAYERS OF REINFORCEMENT ARE PROVIDED
3. THIS DETAIL TO BE USED ONLY WHEN NO OTHER DETAIL IS INDICATED ON THE DRAWINGS.

1 ADDITIONAL REINFORCEMENT AT OPENINGS DETAIL 12" DIA OR LARGER

0600X-DD-C0475 NTS



1. CUT NORMAL REINFORCEMENT CLEAR OF OPENING.
2. DIAGONAL BARS TO BE PLACED:
 - A. AT ϕ OF WALL OR SLAB WHERE ONE LAYER OF REINFORCEMENT IS PROVIDED.
 - B. AT EACH FACE OF WALL OR SLAB WHERE TWO LAYERS OF REINFORCEMENT ARE PROVIDED.
3. UNLESS OTHERWISE NOTED, SIZE OF DIAGONAL BARS SHALL BE THE SIZE OF THE LARGEST NORMAL REINFORCED BAR CUT.
4. THIS DETAIL TO BE USED ONLY WHEN CALLED FOR ON THE DRAWINGS OR WHEN NO OTHER DETAIL IS SPECIFIED.

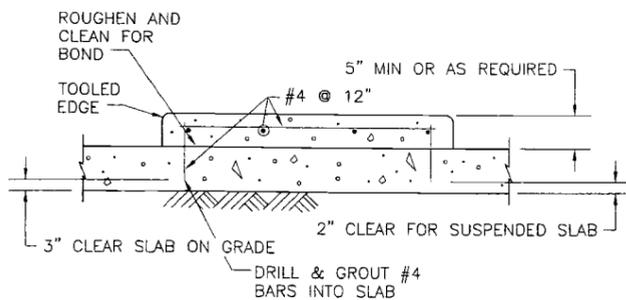
2 DIAGONAL REINFORCEMENT AT OPENINGS DETAIL 8" 11" DIA

0600X-DD-C0475 NTS

NOTES

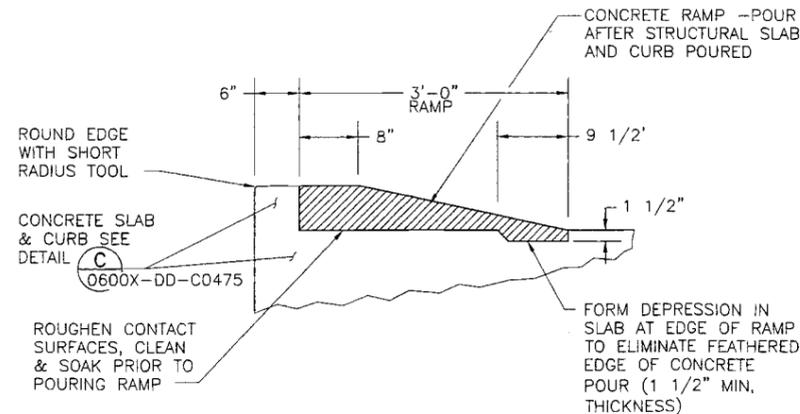
WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
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Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contractual obligations or release any liability placed on the contract.			
DATE	BY	DATE	BY
11-23-2009	W.A. Blum	11-23-2009	W.A. Blum
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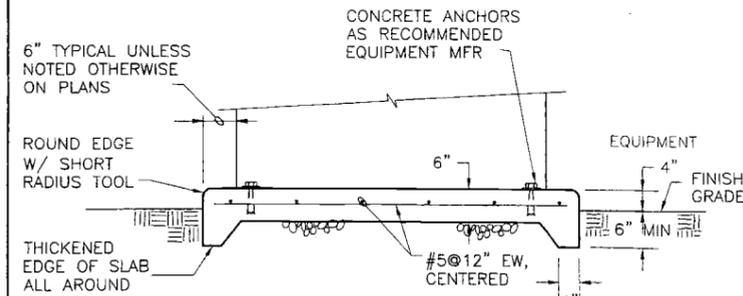
3 HOUSE KEEPING PAD DETAIL

0600X-DD-E0225 NTS



4 RAMP DETAIL

0600X-DD-C0475 NTS



5 EQUIPMENT PAD DETAIL

0600X-DD-E0219 NTS



DOCUMENT CONTROL 06-11-2009

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENGR/ CHK	SYS ENGR	PROJ ENGR
	11/13/09	ISSUED FOR AWARD						

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

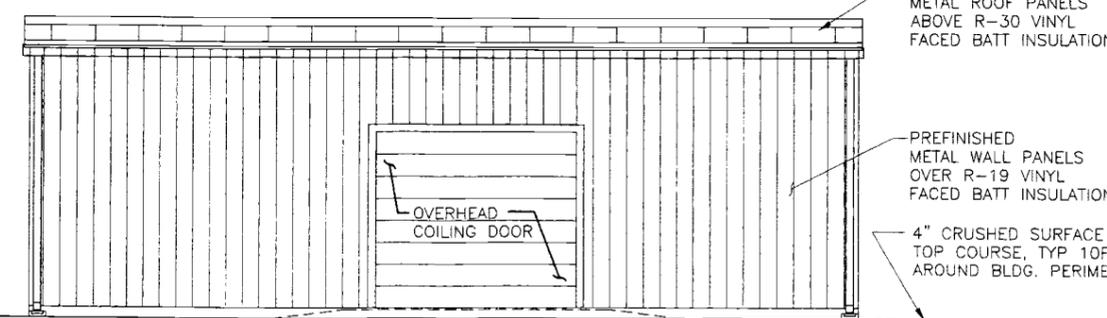
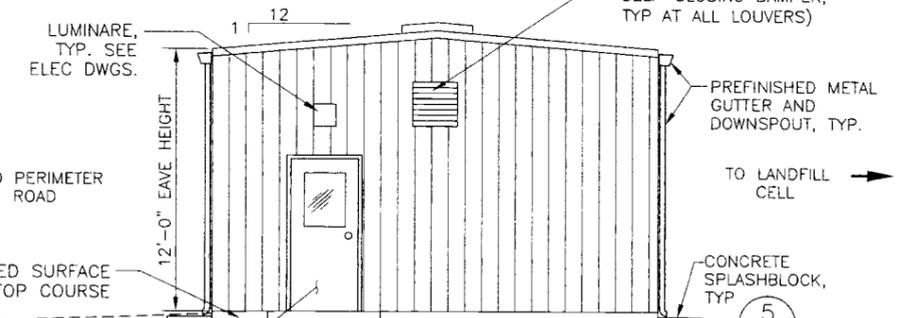
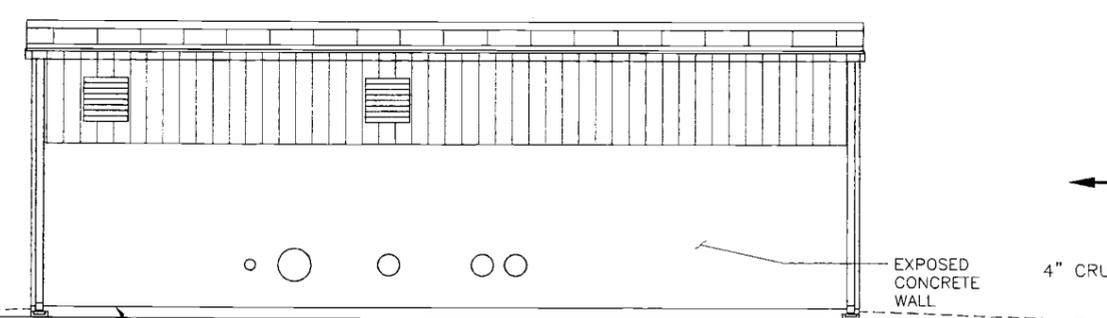
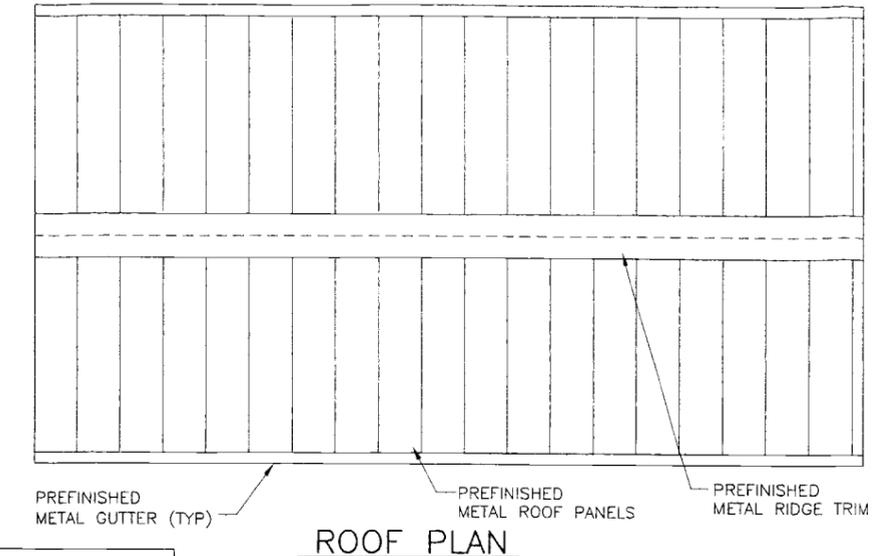
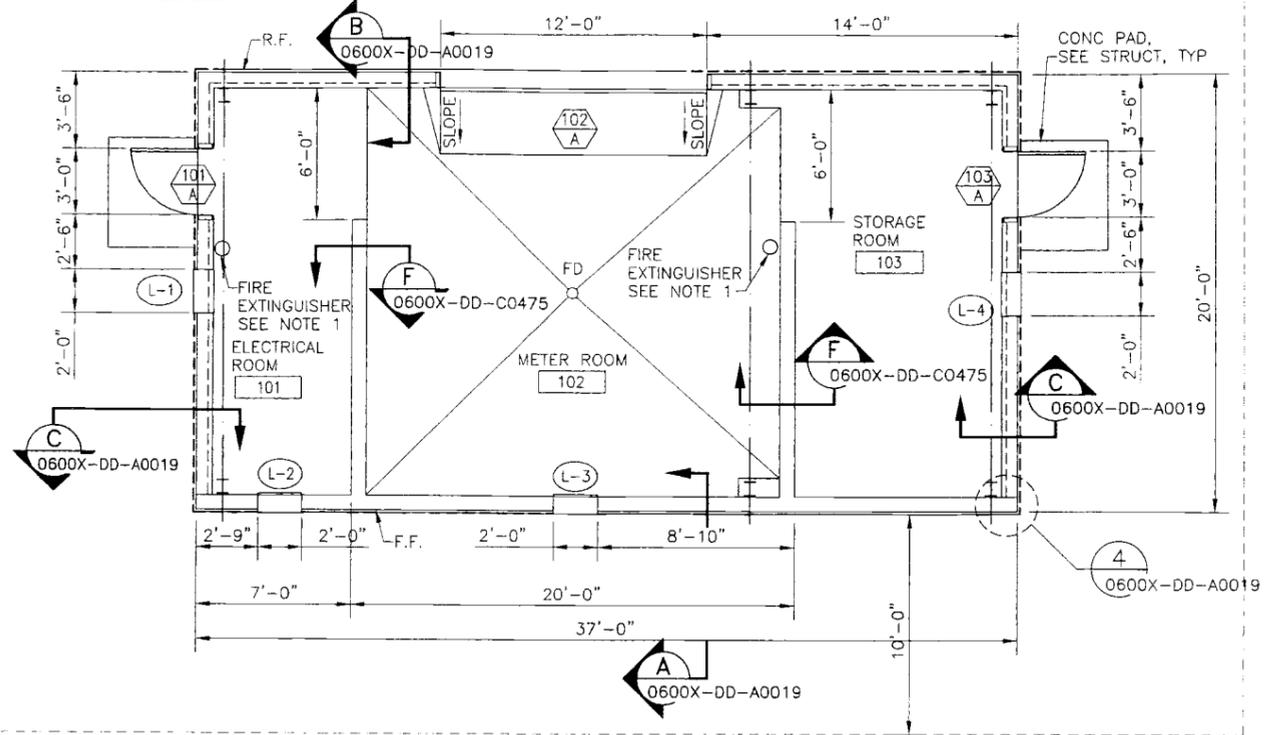
WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
STRUCTURAL DETAILS - 1

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDC0476.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-C0476	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16368 SHT01	600G	0901



CODE NOTES (2006 IBC)

OCCUPANCY:	F-2 (FACTORY LOW HAZARD)
CONSTRUCTION TYPE:	V
ALLOWABLE FLOOR AREA:	13,000 S.F.
ACTUAL FLOOR AREA:	740 S.F.
ALLOWABLE HEIGHT:	40 FT.
ALLOWABLE NUMBER OF STORIES:	TWO
ACTUAL NUMBER OF STORIES:	ONE
NUMBER OF OCCUPANTS (CALCULATED):	2.47 = 3
ACTUAL NUMBER OF OCCUPANTS:	NOT NORMALLY OCCUPIED

NOTES

1. FIRE EXTINGUISHER SPECIFICATIONS

GENERAL:

CONFORM TO NATIONAL FIRE PROTECTION ASSOCIATION (NFPA): NO. 10 STANDARD FOR PORTABLE FIRE EXTINGUISHERS.

A. PROVIDE HAND EXTINGUISHER FOR THE ELECTRICAL ROOM THAT MEETS THE FOLLOWING REQUIREMENTS:

- CARBON DIOXIDE.
- PRESSURIZED, RED ENAMELED STEEL SHELL CYLINDER.
- ACTIVATED BY TOP SQUEEZE HANDLE.
- AGENT PROPELLED THROUGH HOSE AND SPREADER NOZZLE.
- FOR USE ON B AND C CLASS FIRES.
- MINIMUM UL RATING: 10B:C, 15-POUND CAPACITY.

B. PROVIDE HAND EXTINGUISHER FOR THE METER ROOM THAT MEETS THE FOLLOWING REQUIREMENTS:

- TRI-CLASS DRY CHEMICAL EXTINGUISHING AGENT.
- PRESSURIZED, RED ENAMELED STEEL SHELL CYLINDER.
- ACTIVATED BY TOP SQUEEZE HANDLE.
- AGENT PROPELLED THROUGH HOSE AND SPREADER NOZZLE.
- FOR USE ON A, B, AND C CLASS FIRES.
- MINIMUM UL RATING: 4A-60B:C, 10-POUND CAPACITY.

FURNISH HEAVY-DUTY BRACKETS WITH CLIP-TOGETHER STRAP FOR WALL MOUNTING.

EXECUTION:

PROVIDE AT LOCATIONS SHOWN OR AS DIRECTED BY CONTRACTOR.

MOUNT HANGERS SECURELY IN POSITION, FOLLOWING MANUFACTURER'S RECOMMENDATIONS.

TOP OF EXTINGUISHER: NO MORE THAN 54-INCHES ABOVE FLOOR.

DOCUMENT CONTROL *De. Santos*

2. BLDG TYPICAL (2 PLACES) FOR CELLS 9 & 10.

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	DRG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
1	11/15/09	ISSUED FOR AWARD	QSP	DRS	RAJ	DB	N/A	MHF

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

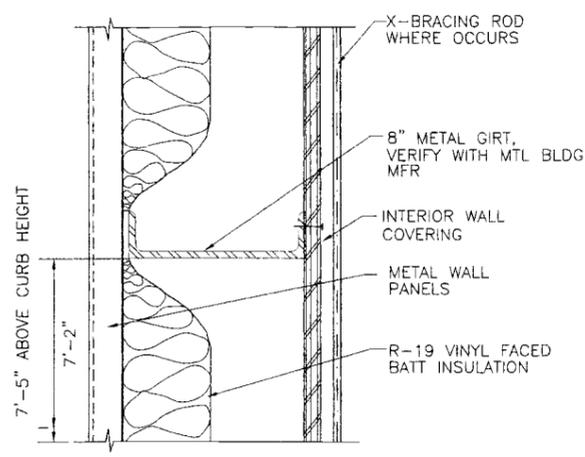
WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
CREST PAD BLDG - PLANS AND ELEVATIONS

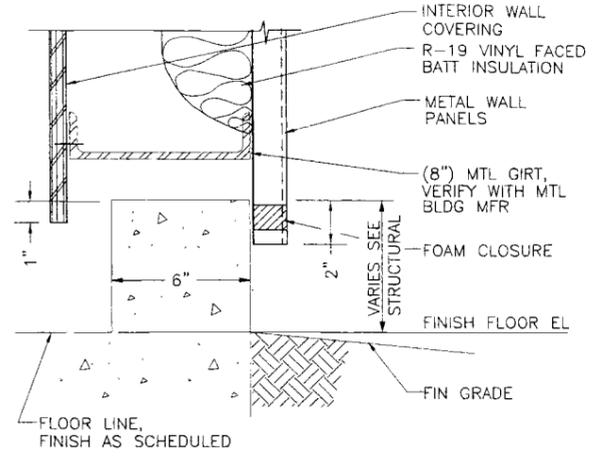
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDA0018.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-A0018	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16371 SHT01	600G	0801



A TYPICAL WALL DETAIL AT WALL COVERING
0600X-DD-A0018 NTS



B TYPICAL WALL/CURB DETAIL
0600X-DD-A0018 NTS

- NOTES**
- ALL EXTERIOR METAL TRIM AND FLASHING SHALL BE FACTORY FINISHED IN COLOR MATCHING WALL PANELS AND PROVIDED BY METAL BUILDING MANUFACTURER.
 - METAL BUILDING MANUFACTURER SHALL PROVIDE TRIM AND FLASHING IN CONFIGURATIONS THAT ALLOW FOR THERMAL MOVEMENT.

WASHINGTON CLOSURE HANFORD SUPPLIER SUBCONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed
2. Review and request. Work may proceed prior to resubmission.
3. Review and request. Work may proceed prior to resubmission subject to resolution of disputed comments.
4. Review and request. Work may not proceed.
5. Permission to proceed not required.

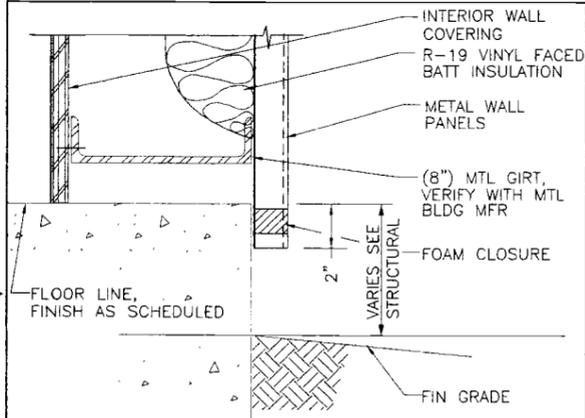
Permitted to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.

W.A. Salway
11-23-2009
DOCUMENT NUMBER: 0600X-DD-A0019-050

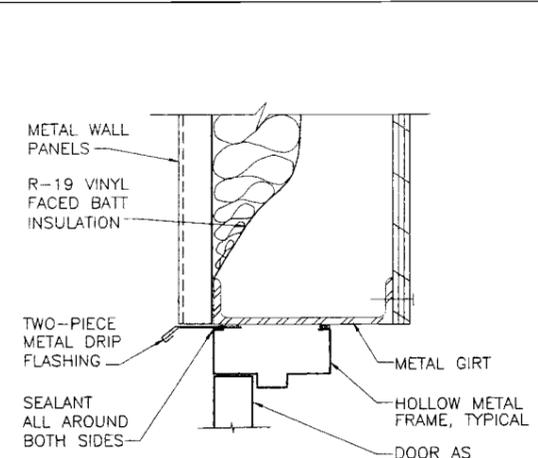
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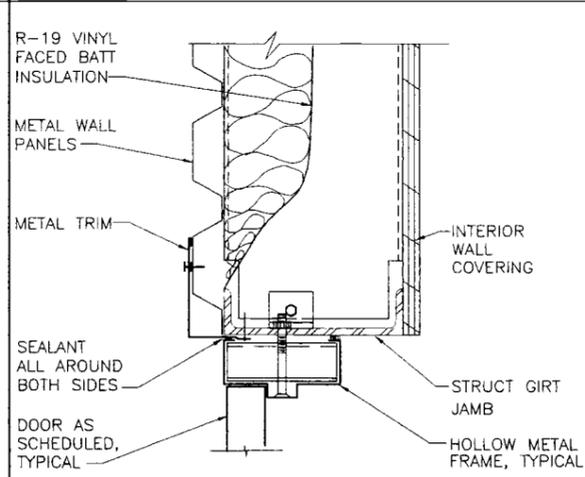
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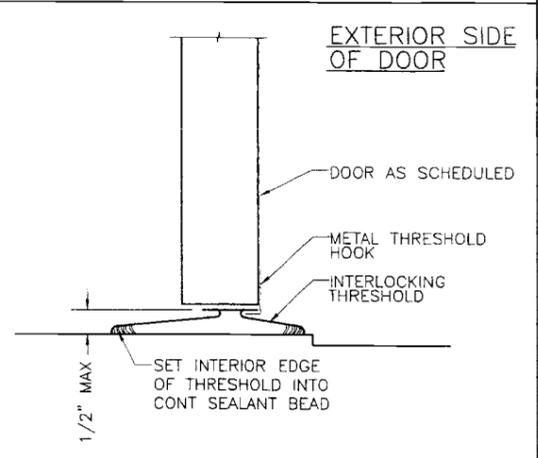
C TYPICAL WALL DETAIL
0600X-DD-A0018 NTS



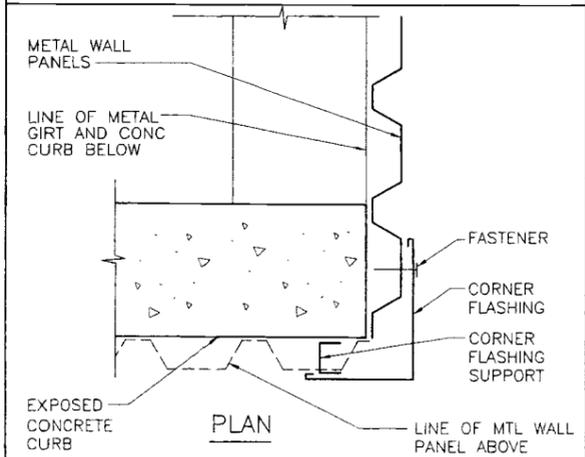
1 DOOR HEAD
0600X-DD-A0020 NTS



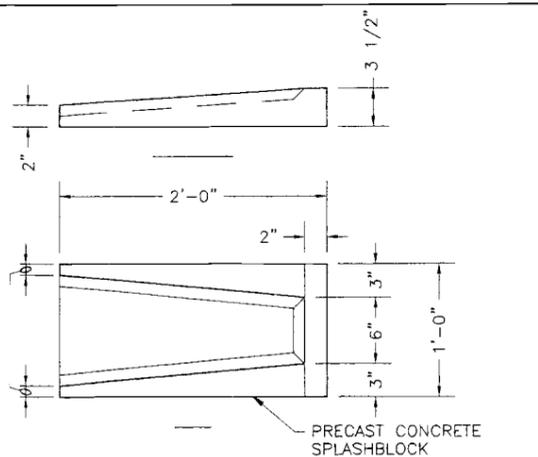
2 DOOR JAMB
0600X-DD-A0020 NTS



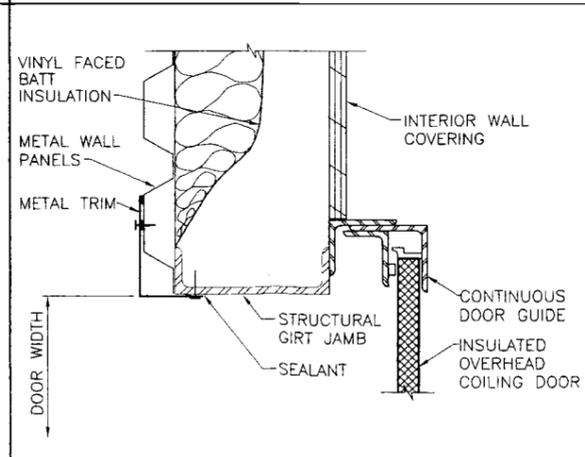
3 DOOR SILL
0600X-DD-A0020 NTS



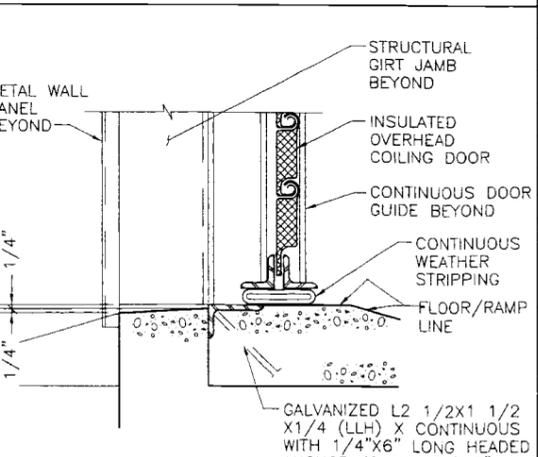
4 CORNER DETAIL
0600X-DD-A0018 NTS



5 SPLASHBLOCK
0600X-DD-A0018 NTS



OVERHEAD COILING
6 DOOR JAMB
0600X-DD-A0020 NTS



OVERHEAD COILING
7 DOOR SILL
0600X-DD-A0020 NTS

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ENGR	ENGR/CHK	SYS ENGR	PROJ ENGR
0	11/23/09	ISSUED FOR AWARD						

SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
ARCHITECTURAL DETAILS - 1

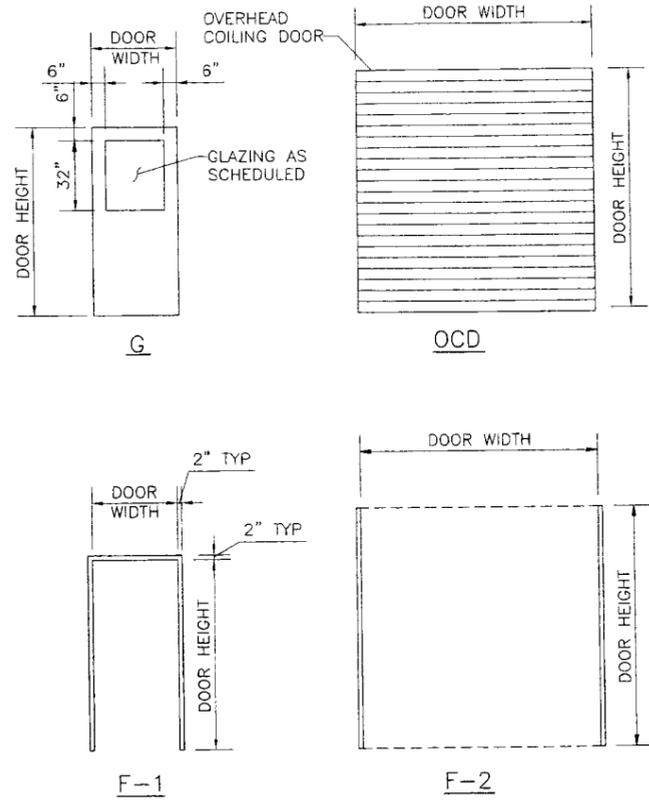
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDA0019.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-A0019	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16372 SHT01	600G	0801

DOOR AND FRAME TYPES



INTERIOR FINISH SCHEDULE

ABBREVIATIONS:

AL	ALUMINUM	HGT	HEIGHT
AS	AS SELECTED	HDNR	CLEAR FLOOR HARDENER
CLR	CLEAR	INSUL	VINYL FACED BATT INSULATION
COL	COLOR	MATL	MATERIAL
CONC	CONCRETE	MET	METAL
EXP	EXPOSED STRUCTURE	MSG	MANUFACTURER'S STANDARD
FCTY	FACTORY	WD	WOOD
FNSH	FINISH		

NOTES:

- NUMBERS IN FINISH COLUMN REFER TO PAINT SYSTEMS IN TECHNICAL SPECIFICATION FOR COATINGS AND FINISHES.
- CODES IN "COL" COLUMN, REFER TO COLOR LIST ON THIS SHEET.
- FOR EXTERIOR FINISHES AND COLORS, SEE THIS SHEET AND ELEVATION DRAWINGS.
- REFER TO TECHNICAL SPECIFICATION FOR REINFORCED CONCRETE FOR SCHEDULE OF CONCRETE FINISHES.
- INTERIOR WALLS AND CEILING SHEATHED FULL HEIGHT WITH INTERIOR WALL AND CEILING COVERING.
- CONCRETE CURB VARIES IN HEIGHT, SEE STRUCTURAL DRAWINGS.
- PAINT MISCELLANEOUS METALS WITH PS-5, COLOR P-3.
- PLYWOOD AT EXTERIOR WALLS TO BE FULL HEIGHT ABOVE CONCRETE CURB ELEV.

NO.	SPACE NAME	FLOOR			BASE			TYPICAL WALL			OTHER WALL			CEILING			MISC.				
		SUB FL	FNSH	COL	HGT	MATL	FNSH	COL	WALLS	MATL	FNSH	COL	WALL	MATL	FNSH	COL		HGT	MATL	FNSH	COL
CREST PAD BUILDING																					
101	ELECTRICAL ROOM	CONC	HDNR	CLR	--	--	--	--	--	NOTE 5	PS-2	P-3	NOTE 5	NOTE 5	PS-2	P-3	VARIES	NOTE 5	PS-2	P-3	NOTE 7 NOTE 8
102	METER ROOM	CONC	PS-6	P-1	NOTE 6	CONC	PS-6	P-3	ALL	NOTE 5	PS-2	P-3	NOTE 5	NOTE 5	PS-2	P-3	VARIES	NOTE 5	PS-6	P-3	NOTE 7 NOTE 8
103	STORAGE ROOM	CONC	PS-6	P-1	NOTE 6	CONC	PS-6	P-3	ALL	NOTE 5	PS-2	P-3	NOTE 5	NOTE 5	PS-2	P-3	VARIES	NOTE 5	PS-6	P-3	NOTE 7 NOTE 8

DOOR AND HARDWARE SCHEDULE

ABBREVIATIONS:

AL	ALUMINUM	HM	HOLLOW METAL
AS	AS SELECTED	MATL	MATERIAL
COL	COLOR	MET	METAL
FCTY	FACTORY	TG	TEMPERED GLASS
FNSH	FINISH		

NOTES:

- NUMBERS IN "FNSH" COLUMN REFER TO PAINT SYSTEMS IN TECHNICAL SPECIFICATION FOR COATINGS AND FINISHES.
- CODES ON "COL" COLUMN REFER TO COLOR LIST ON THIS SHEET.
- FOR GLASS TYPES AND HARDWARE SETS, REFER TO TECHNICAL SPECIFICATIONS FOR CREST PAD BUILDING.
- METAL BUILDING MANUFACTURER'S STANDARD.
- FOR DOOR DETAILS SEE DRAWINGS 0600X-DD-A0019
- PROVIDE NAMEPLATES ON EACH SIDE OF DOOR. MESSAGE TEXT TO MATCH ROOM NAME IN INTERIOR FINISH SCHEDULE. REFER TO TECHNICAL SPECIFICATION FOR CREST PAD BUILDING.

NO.	DOOR SIZE		DOOR					FRAME				DETAILS			HARDWARE SET NO.	FIRE PROTECTION RATING	OTHER REQUIREMENTS
	WIDTH	HEIGHT	CONSTR	TYPE	GLASS	FNSH	COL	MATL	TYPE	FNSH	COL	HEAD	JAMB	SILL			
CREST PAD BUILDING																	
101A	3'-0"	7'-0"	HM	G	TG	PS-5	P-2	HM	F-1	PS-5	P-2	1	2	3	HDW-1	--	--
102A	12'-0"	9'-0"	MET	OCD	--	PS-5	P-2	MET	F-2	PS-5	P-2	NOTE 4	6	7	HDW-3	--	--
103A	3'-0"	7'-0"	HM	G	TG	PS-5	P-2	HM	F-1	PS-5	P-2	1	2	3	HDW-1	--	NOTE 6

EXTERIOR FINISH SCHEDULE

ITEM / MATERIAL	FINISH	COLOR
PREFINISHED METAL WALL PANEL	FCTY	M-1
PREFINISHED METAL ROOF PANEL	FCTY	M-2
CAST-IN-PLACE CONCRETE	AS SPECIFIED	NATURAL GRAY
PREFINISHED GUTTER AND DOWNSPOUTS	FCTY	M-1

LOUVER SCHEDULE

ABBREVIATIONS:

DB	DRAINABLE BLADE
----	-----------------

NOTES:

- METAL BUILDING MANUFACTURER'S STANDARD DETAIL.
- PROVIDE SELF-CLOSING DAMPER

NO.	OPENING		LOUVER				DETAILS			OTHER REQUIREMENTS
	WIDTH	HEIGHT	TYPE	MATL	FNSH	COL	HEAD	JAMB	SILL	
L-1	2'-0"	2'-0"	DB	AL	FCTY	0-1		NOTE 1	SILL AT 10'-6" AFF, NOTE 2	
L-2	2'-0"	2'-0"	DB	AL	FCTY	0-1		NOTE 1	SILL AT 10'-6" AFF, NOTE 2	
L-3	2'-0"	2'-0"	DB	AL	FCTY	0-1		NOTE 1	SILL AT 10'-6" AFF, NOTE 2	
L-4	2'-0"	2'-0"	DB	AL	FCTY	0-1		NOTE 1	SILL AT 10'-6" AFF, NOTE 2	

COLOR LIST

NOTES:

- COLOR SELECTIONS FOR THIS PROJECT MAY BE NOTED IN DOOR AND HARDWARE SCHEDULE, INTERIOR FINISH SCHEDULE, EXTERIOR FINISH SCHEDULE, AND ON THE DRAWINGS, BY THE LETTER-NUMBER COMBINATION IN THE IN THE MARK COLUMN OF THE LIST.
- SOME COLOR SELECTIONS MAY BE MADE IN VARIOUS SPECIFICATION SECTIONS.
- USE ONLY THE COLORS NOTED OR SCHEDULED. IF A COLOR SELECTION IS NOT MADE, REQUEST ONE FROM CONTRACTOR.

MARK	ITEM	MANUFACTURER	COLOR	OTHER REQUIREMENTS
P	PAINTING			
P-1	PAINT (FLOOR)	AS SPECIFIED	STANDARD GRAY	MATCH EXISTING CREST PAD BUILDINGS
P-2	PAINT (DOORS AND FRAMES)	AS SPECIFIED	AS SELECTED	
P-3	PAINT	AS SPECIFIED	AS SELECTED	
M	MISCELLANEOUS			
M-1	PREFINISHED METAL WALL PANELS, GUTTERS & DOWNSPOUTS	METAL BUILDING MFR	LIGHT BRONZE	MATCH EXISTING CREST PAD BUILDINGS
M-2	PREFINISHED METAL ROOF PANELS	METAL BUILDING MFR	LIGHT BRONZE	MATCH EXISTING CREST PAD BUILDINGS
M-3	VINYL FACED BATT INSULATION	METAL BUILDING MFR	WHITE	
O	OPENING			
O-1	LOUVER	METAL BUILDING MFR	LIGHT BRONZE	MATCH EXISTING CREST PAD BUILDINGS

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16373 SHT01	600G	0801

NOTES

- ALL SCHEDULES APPLY TO BOTH CREST PAD BUILDINGS.
- ALL COLOR SELECTIONS SHALL BE VERIFIED BY CONTRACTOR PRIOR TO PURCHASE AND INSTALLATION OR APPLICATION OF MATERIAL.

WASHINGTON CLOSURE HANFORD JOB NO. 14655

1. Work may proceed.
2. Review and rework. Work may proceed prior to resubmission subject to resolution of indicated comments.
3. Drawings and materials. Work may not proceed.
4. Permitting is proceed not required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, and methods, or materials developed or selected by the consultant/contractor and does not relieve consultant/contractor from full compliance with contractual obligations or release any "liability" placed on the contract.

W.A. Balasingh
11-23-2009
DOCUMENT NUMBER: 0600X-DD-A0020-05
DATE: 11-23-2009

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DOCUMENT CONTROL 11/23/09

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENGR	ENGR	ENGR	SYS ENGR	PROJ ENGR
0	11/19/09	ISSUED FOR AWARD	WAB	WAB	WAB	WAB	WAB	WAB	WAB

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
FINISH SCHEDULES

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDA0020.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-A0020	0

DRAWING NO.	REV. NO.
0600X-DD-M0053	0

PUMP SCHEDULE

EQUIPMENT NO.	LOCATION	SERVICE	PIPE FLOW	T.D.H.	MOTOR SIZE (MIN)	TYPE	REMARKS
2-P-32	TRENCH CELL 9 PRIMARY SUMP (PUMP 1)	LEACHATE	140gpm	140 ft	7.5hp	SUBMERSIBLE CENTRIFUGAL	MOUNTED ON WHEELED TROLLEYS
2-P-33	TRENCH CELL 9 PRIMARY SUMP (PUMP 2)	LEACHATE	15gpm	140 ft	0.75hp	SUBMERSIBLE CENTRIFUGAL	MOUNTED ON WHEELED TROLLEYS
2-P-34	TRENCH CELL 9 SECONDARY SUMP (PUMP 3)	LEACHATE	15gpm	140 ft	0.75hp	SUBMERSIBLE CENTRIFUGAL	MOUNTED ON WHEELED TROLLEYS
2-P-35	TRENCH CELL 10 PRIMARY SUMP (PUMP 1)	LEACHATE	140gpm	140 ft	7.5hp	SUBMERSIBLE CENTRIFUGAL	MOUNTED ON WHEELED TROLLEYS
2-P-36	TRENCH CELL 10 PRIMARY SUMP (PUMP 2)	LEACHATE	15gpm	140 ft	0.75hp	SUBMERSIBLE CENTRIFUGAL	MOUNTED ON WHEELED TROLLEYS
2-P-37	TRENCH CELL 10 SECONDARY SUMP (PUMP 3)	LEACHATE	15gpm	140 ft	0.75hp	SUBMERSIBLE CENTRIFUGAL	MOUNTED ON WHEELED TROLLEYS

METER SCHEDULE

METER NO.	LOCATION	SERVICE	TYPE	PIPE SIZE	FLOW RANGE	REMARKS
2-M-26	CREST PAD CELL 9 (PUMP 1)	LEACHATE	PADDLE METER	3"	0-200gpm	
2-M-27	CREST PAD CELL 9 (PUMP 2)	LEACHATE	PADDLE METER	1"	0-30gpm	
2-M-28	CREST PAD CELL 9 (PUMP 3)	LEACHATE	PADDLE METER	1"	0-30gpm	
2-M-29	CREST PAD CELL 10 (PUMP 1)	LEACHATE	PADDLE METER	3"	0-200gpm	
2-M-30	CREST PAD CELL 10 (PUMP 2)	LEACHATE	PADDLE METER	1"	0-30gpm	
2-M-31	CREST PAD CELL 10 (PUMP 3)	LEACHATE	PADDLE METER	1"	0-30gpm	

PIPING IDENTIFICATION SCHEDULE

FLUID ABBREVIATION	FUNCTION	PIPING MATERIALS (SEE SCHEDULE BELOW)				FIELD TEST REQUIREMENTS (SEE NOTE 4 AND NOTE 5)		
		EXPOSED PIPING		BURIED PIPING		MINIMUM TEST PRESSURE PSI	TEST MEDIUM	LEAKAGE ALLOWANCE (SEE NOTE 3)
		2 IN. DIA. AND SMALLER	2-1/2 IN. DIA. AND LARGER	2 IN. DIA. AND SMALLER	2-1/2 IN. DIA. AND LARGER			
CN	CONTAINMENT PIPE	---	---	---	26	SEE SPEC	WATER	(A),(B)
LC	LEACHATE COLLECTION	---	---	---	25	---	---	---
LCC	LEACHATE COLLECTION CLEANOUT	---	26	---	26	---	---	---
LE	LEACHATE	16	16	26	26	SEE SPEC	WATER	(A),(B)
RW	RAW WATER (NON-POTABLE)	---	---	---	35,25	SEE SPEC	WATER	(C)
TSR	TRENCH SUMP RISER PIPE	---	26	---	25,26	---	---	---
TSS	TRENCH SUMP SIGNAL CABLE PIPE	---	---	37	---	---	---	---
LYS	LYSIMETER ACCESS PIPE	---	26	---	25, 26	---	---	---

PIPING MATERIAL SCHEDULE
(SEE NOTE 5)

GROUP NO.	PIPE	FITTINGS	VALVES, 6 INCHES AND SMALLER (SEE NOTE 6 & 7)
16	POLYVINYL CHLORIDE SEE SPECIFICATION 0600X-SP-M0032	POLYVINYL CHLORIDE SEE SPECIFICATION 0600X-SP-M0032	SEE SPECIFICATION 0600X-SP-M0032
25	HDPE PERFORATED SEE SPECIFICATION 0600X-SP-M0032	HDPE, THERMAL BUTT-FUSION, SEE SPECIFICATION 0600X-SP-M0032	-----
26	HDPE SEE SPECIFICATION 0600X-SP-M0032	HDPE, THERMAL BUTT-FUSION SEE SPECIFICATION 0600X-SP-M0032	-----
35	POLYVINYL CHLORIDE SEE SPECIFICATION 0600X-SP-M0032	SHORT BODY CAST IRON OR DUCTILE IRON SEE SPECIFICATION 0600X-SP-M0032	SEE SPECIFICATION 0600X-SP-M0032
37	POLYVINYL CHLORIDE, SCHEDULE 40: TYPE 1, GRADE 1, OR CLASS 12454-13 CONFORMING TO ASTM D1784, AND ASTM D1785	POLYVINYL CHLORIDE, SCHEDULE 40, ASTM D2466 AND ASTM D2467 FOR SOCKET WELD. USE SCHEDULE 80 ASTM D2464 FITTINGS FOR ANY FITTINGS REQUIRING THREADS.	-----

MANHOLE COORDINATE SCHEDULE
(SEE NOTE 2)

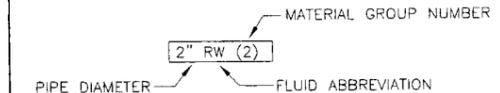
COORDINATE NO.	MANHOLE NO.	INVERT ELEV. IN	INVERT ELEV. OUT	SIDE INLET ELEV.	TOP OF MH ELEV.	DIA. FT	NOTES
3530	MH-32	722.54	722.50	722.52	730.30	8	INVERT EL PIPES IN/OUT-10" LE(26). SIDE INLET 4" LE(26)
3531	MH-33	---	725.00	725.02	730.30	8	INVERT EL PIPES OUT-10" LE(26). SIDE INLET 4" LE(26)
3532	MH-34	720.07	720.03	---	728.40	8	INVERT EL PIPES IN/OUT-10" LE(26).
3533	MH-35	717.57	717.53	---	726.40	8	INVERT EL PIPES IN/OUT-10" LE(26).
3534	MH-36	712.78	712.74	---	719.40	8	INVERT EL PIPES IN/OUT-10" LE(26).
3535	MH-37	710.28	710.24	---	717.20	8	INVERT EL PIPES IN/OUT-10" LE(26).
3536	MH-38	696.43	696.39	---	702.05	8	INVERT EL PIPES IN/OUT-10" LE(26).
3537	MH-39	696.04	696.00	---	700.50	8	INVERT EL PIPES IN/OUT-10" LE(26).
3538	MH-21	MATCH EXISTING	MATCH EXISTING	---	700.50	8	INVERT EL PIPES IN/OUT-8" LE(26).

NOTES

- SEE ELECTRICAL DRAWING 0600X-DD-E0090 FOR UNIT HEATERS, EXHAUST FANS AND LOUVERS.
- SEE DRAWING 0600X-DD-G0047 FOR COORDINATE INFORMATION.
- LEAKAGE ALLOWANCE IS AS FOLLOWS:
(A) PIPES SO DESIGNATED SHALL SHOW ZERO LEAKAGE.
(B) PIPES SO DESIGNATED SHALL NOT SHOW A LOSS OF PRESSURE OF MORE THAN 5 PERCENT.
(C) SEE SPECS.
- FOR FIELD TEST PROCEDURES AND ADDITIONAL TEST REQUIREMENTS, SEE PIPING SECTION OF SPECIFICATIONS.
- ANY ALLOWABLE DEVIATION FROM THE PIPING MATERIALS OR FIELD TEST REQUIREMENTS SHOWN WILL BE NOTED IN THE SPECIFICATIONS OR ON THE DRAWINGS.
- FOR SPECIAL VALVES SEE SPECIFICATIONS. FOR MANHOLE VALVES SEE MANHOLE FITTING SCHEDULE.
- VALVES 2-1/2 INCH AND SMALLER MAY HAVE SCREWED ENDS VALVES 3 INCH AND LARGER SHALL HAVE FLANGED ENDS, UNLESS OTHERWISE SHOWN OR SPECIFIED.

DOCUMENT CONTROL *De Wadlog*

TYPICAL PIPE DESIGNATION:



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WASHINGTON CLOSURE HANFORD LLC		JOB NO. 14655
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DATE	TIME	BY
11-23-2009	10:00	W.B. [Signature]
DOCUMENT NUMBER		DATE
S06X544000003-05014 052		11-23-2009



REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENGR	ENGR	SYS ENGR	PROJ ENGR

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. WEAVER BOOS CONSULTANT LLC
RICHLAND, WASHINGTON DENVER, CO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
MECHANICAL SCHEDULES

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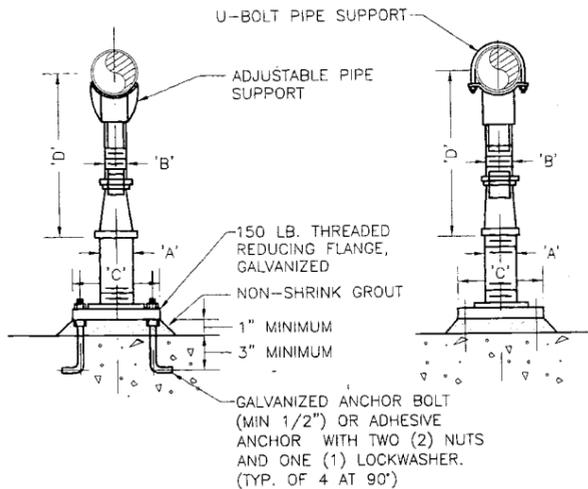
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ERDF	0600X-DD-M0053	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16376 SHT01	600G	9901



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REV. NO. 0

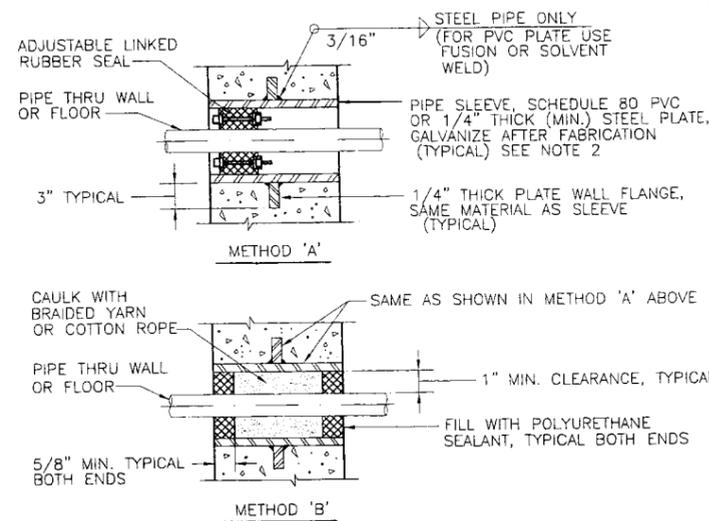


ADJUSTABLE PIPE SUPPORT
APPROXIMATE DIMENSIONS IN MM(INCHES)

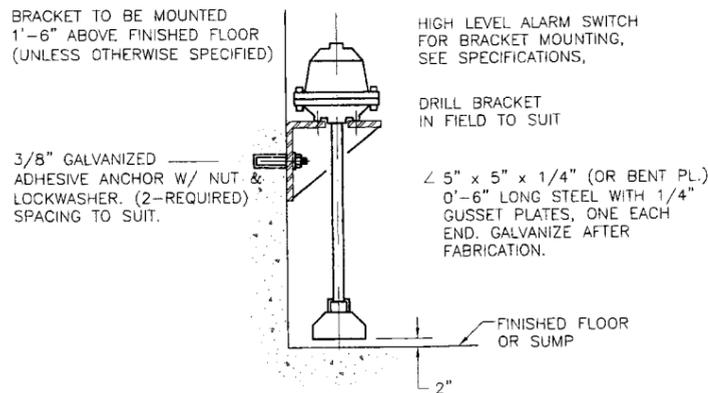
PIPE SIZE	'A'	'B'	'C'	'D' MINIMUM	'D' MAXIMUM
2-1/2"	2-1/2"	1-1/2"	9"	8"	11-1/2"
3"	2-1/2"	1-1/2"	9"	8-1/4"	11-3/4"
3-1/2"	2-1/2"	1-1/2"	9"	8-1/2"	12"
4"	3"	* 2-1/2"	9"	10-1/4"	14"
6"	3"	* 2-1/2"	9"	11-5/8"	15-1/4"
8"	3"	* 2-1/2"	9"	13-5/8"	16-1/2"
10"	3"	* 2-1/2"	9"	14-5/8"	18-1/4"
12"	3"	* 2-1/2"	9"	15-5/8"	19-3/4"
14"	4"	3"	11"	18-7/8"	20-3/4"
16"	4"	3"	11"	19-7/8"	22-1/4"
18"	6"	3-1/2"	13-1/2"	21-1/4"	24"
20"	6"	3-1/2"	13-1/2"	23-1/4"	25-1/2"
24"	6"	4"	13-1/2"	26-1/2"	28-1/4"
30"	6"	4"	13-1/2"	29-5/8"	31-1/2"
32"	6"	4"	13-1/2"	30-5/8"	32-3/4"
36"	6"	4"	13-1/2"	32-5/8"	34-3/4"

* SEE MFR.

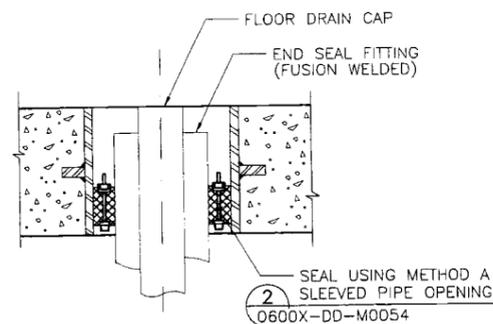
1 ADJUSTABLE PIPE SUPPORT WITH OR WITHOUT U-BOLT
0600X-DD-M0057, M0058, M0059 NTS



2 SLEEVED PIPE OPENING
0600X-DD-M0054, M0056, M0057, M0058, M0059 NTS



3 FLOOD ALARM SWITCH
0600X-DD-M0057, M0058, M0059 NTS



4 FLOOR DRAIN
0600X-DD-C0464, M0054 NTS

NOTES

- THESE SLEEVED PIPE DETAILS ARE TO BE USED IN DRY WALLS ONLY.
- ELIMINATE SLEEVE IN CORE DRILLED WALLS.

WASHINGTON CLOSURE HANFORD JOB NO. 14655
SUPERVISOR/CONTRACTOR DOCUMENT STATUS STAMP

1. Work may proceed.
2. Plans and details may be prepared prior to construction.
3. Plans and details may be prepared prior to construction subject to revision of indicated numbers.
4. Plans and details may be prepared.
5. Plans are to be prepared.

Permitted to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the contractor and does not release the contractor from full compliance with contract requirements or release any "hold" placed on the contract.

W.A. Weaver
11-23-2009
0600X-DD-M0054-053

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NOV 23 2009
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DOCUMENT CONTROL *W.A. Weaver*

REV.	DATE	DESCRIPTION	DRAWN BY	CHECK	ENGR/CHK	ENGR/CHK	SYS ENGR	PROJ ENGR
1	11/23/09	ISSUED FOR AWARD						

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS LLC DENVER, CO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
MECHANICAL DETAILS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDM0054.DWG

TASK	DRAWING NO.	REV. NO.
EDRF	0600X-DD-M0054	0

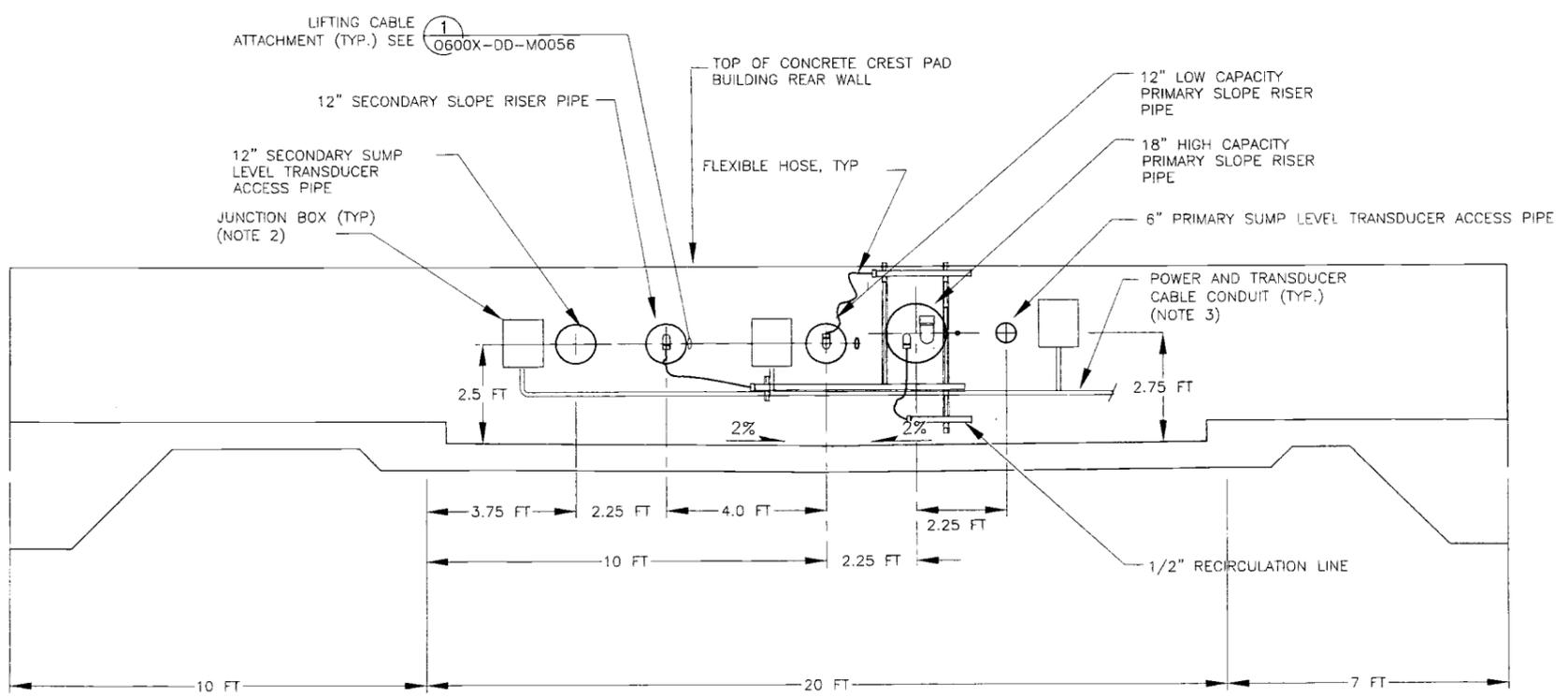
RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16377 SHT01	600G	9901

DRAWING NO. 0600X-DD-M0055
 REV. NO. 0

NOTES

1. ALL WALL PENETRATIONS SHALL BE SEALED WATER TIGHT. PROVIDE FLASHING AND COUNTER FLASHING AS REQUIRED.
2. LOCATE JUNCTION BOXES AND CONDUITS AS CONVENIENT SUBJECT TO CONTRACTOR'S APPROVAL.
3. SEE 0600X-DD-E0228 FOR ADDITIONAL ELECTRICAL DETAILS.



A CREST PAD HEADWALL PIPING PLAN
 0600X-DD-C0464



WASHINGTON CLOSURE HANFORD JOB NO. 14655
 SUPPLIER/CONTRACTOR DOCUMENT STAMP

1. Work may proceed
 2. Review and re-submit. Work may proceed prior to re-submission
 3. Review and re-submit. Work may proceed prior to re-submission subject to reviewer's indicated comments
 4. Review and re-submit. Work may not proceed
 5. Permission to proceed not required

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or services by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contractual obligations or release any notice placed on the contract.

NO.	DATE	BY	DESCRIPTION
1	11-23-2009	J.A. [Signature]	ISSUED FOR AWARD

DOCUMENT ID NUMBER: 05014-054
 WCH - DOCUMENT CONTROL

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DOCUMENT CONTROL [Signature]

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△	11/3/09	ISSUED FOR AWARD	DR	SC	MT	N/A	DR		
REV.	DATE	DESCRIPTION	DRWN BY	CHK	ENG/ENGR	ENG/ENGR	SYS ENGR	PROJ ENGR	

U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
 WEAVER BOOS CONSULTANTS LLC DENVER, CO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
 CELLS 9 - 10
 CREST PAD DETAILS - 1

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDM0055.DWG
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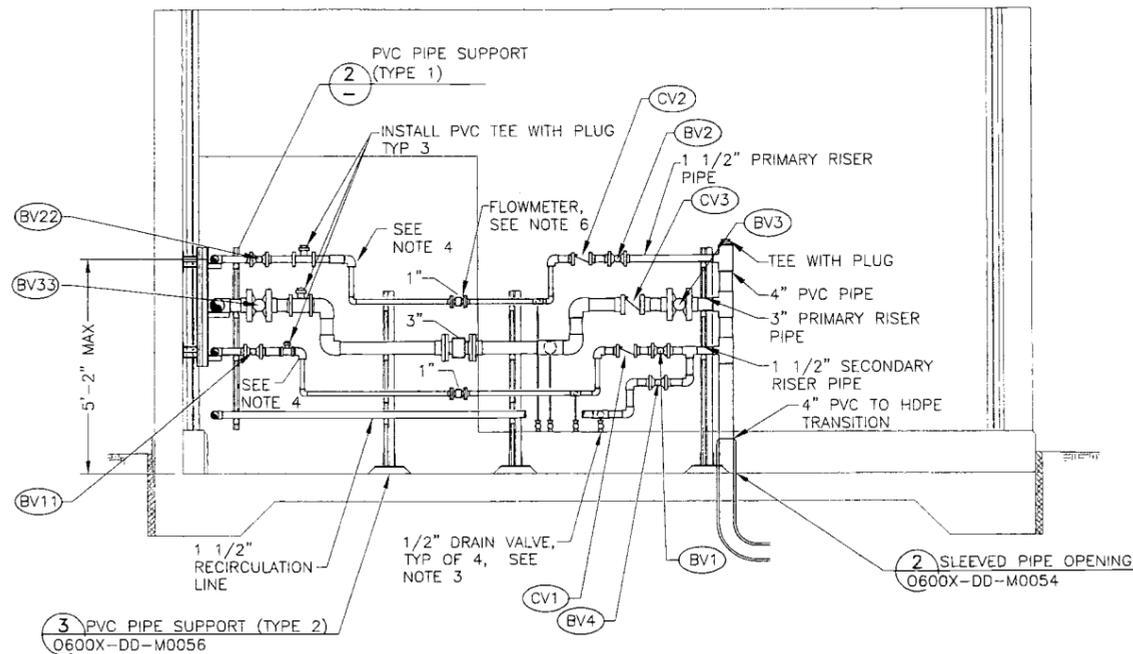
TASK ERDF	DRAWING NO. 0600X-DD-M0055	REV. NO. 0
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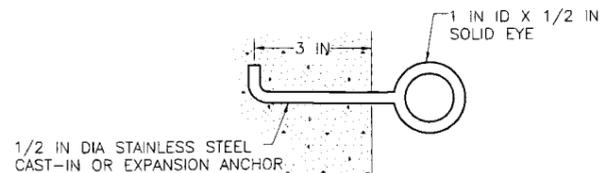
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16378 SHT01	600G	9901



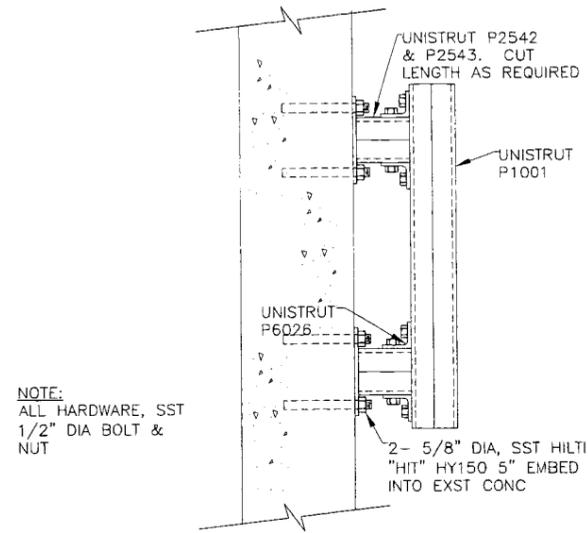
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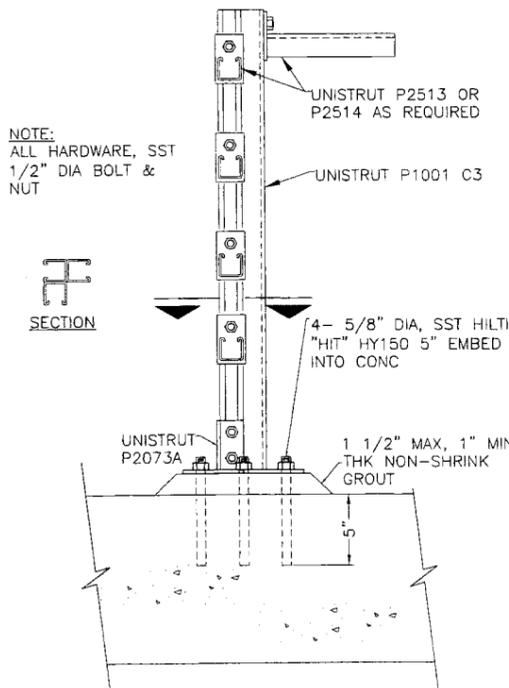
A CREST PAD PIPING PLAN
0600X-DD-C0464



1 LIFTING CABLE ATTACHMENT DETAIL
0600X-DD-M0055 NTS



2 PVC PIPE SUPPORT (TYPE 1)



3 PVC PIPE SUPPORT (TYPE 2)
0600X-DD-C0464.M0056

NOTES

- BOLT FRAMEWORK TO CONCRETE FLOOR USING NUMBER, SIZE, AND TYPE OF ANCHOR BOLTS PER FRAMEWORK MANUFACTURER'S RECOMMENDATIONS.
- PIPE SUPPORT LAYOUT MAY BE ADJUSTED TO SUIT FIELD CONDITIONS WITH APPROVAL OF CONTRACTING OFFICER.
- EXTEND SAMPLE LINES VALVE TO 12" ABOVE FLOOR.
- 1 1/2" X 1" BUSHING IN VERTICAL LEG OF 1 1/2" 90° ELBOW, TYP. 4 PLACES.
- SEE 0600X-DD-E0228 FOR ADDITIONAL ELECTRICAL DETAILS.
- FLOWMETER IDENTIFICATION NUMBERS SHOWN FOR BOTH CREST PAD BUILDINGS, SEE METER SCHEDULE ON 0600X-DD-M0053.
- SEE TECHNICAL SPECIFICATIONS FOR VALVE AND IDENTIFICATION TAG INFORMATION.

LEGEND:

(BV1) VALVE NUMBER

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPERVISOR/CONTRACTOR DOCUMENT STATUS STAMP			
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

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NOV 23 2009
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DOCUMENT CONTROL

REV.	DATE	DESCRIPTION	DRAWN BY	CHECK	ENG'N	ENG'N	ENG'N	PROJ. ENGR.
1	11/23/09	ISSUED FOR AWARD	W.A.B.	W.A.B.	W.A.B.	W.A.B.	W.A.B.	W.A.B.

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS LLC
DENVER, CO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
CREST PAD DETAILS - 2

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDM0056.DWG
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TASK ERDF	DRAWING NO. 0600X-DD-M0056	REV. NO. 0
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RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16379 SHT01	600G	9901

NOTES

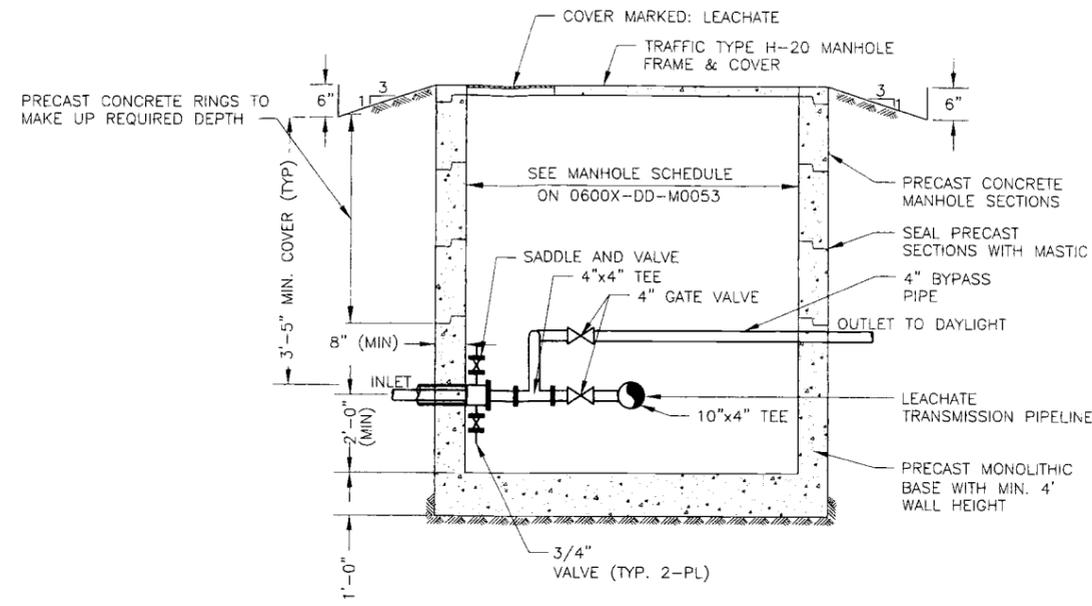
1. ALL JOINTS ARE FUSION WELDED UNLESS SHOWN OTHERWISE.
2. PROVIDE PIPE SUPPORTS AS PER MANUFACTURER'S RECOMMENDATIONS.
3. CONTRACTOR SHALL USE THE SMALLEST PIPE SEGMENTS POSSIBLE FOR FABRICATING FITTINGS.
4. SECONDARY CONTAINMENT AND PENETRATION DETAILS NOT SHOWN.
5. MANHOLE COORDINATE LOCATIONS IS AT INTERSECTION OF PIPES. SEE MANHOLE SCHEDULE ON 0600X-DD-M0053.
6. PROVIDE INDIVIDUAL RUNG LADDER OR FIXED LADDER CONFORMING TO OSHA REQUIREMENTS.
7. VENTS AND DRAINS SHALL BE INSTALLED ON ALL CONTAINMENT PIPES IN MANHOLE.
8. DETAIL REPRESENTS MANHOLE 32 PRIOR TO THE TIE-IN OF CELL 10. AS WELL AS MANHOLE 33.
9. SEE MANHOLE SCHEDULE, DRAWING 0600X-DD-M0053 FOR PIPING ELEVATIONS.
10. FOR CELL 10 TIE-IN, REMOVE KNOCKOUT AND BLIND FLANGE AND CONNECT NEW PIPE TO EXISTING TEE. THE INSTALLATION SHOULD MIRROR EXISTING.

DOCUMENT CONTROL *Dr. Houton*

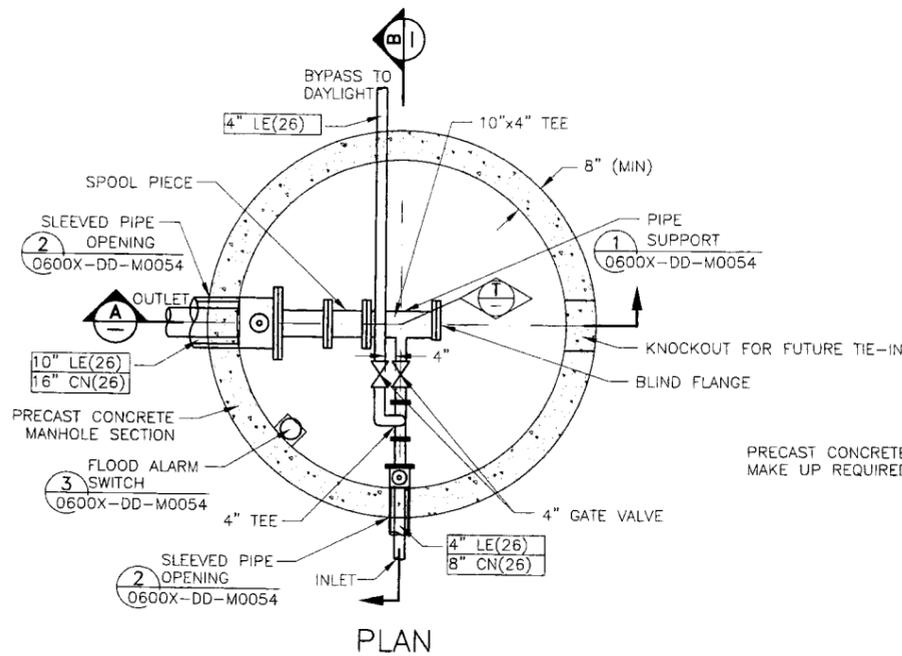
MANHOLE COORDINATES

1. FOR MH-32, COORDINATE NUMBER IS 3530.
2. FOR MH-33, COORDINATE NUMBER IS 3531.

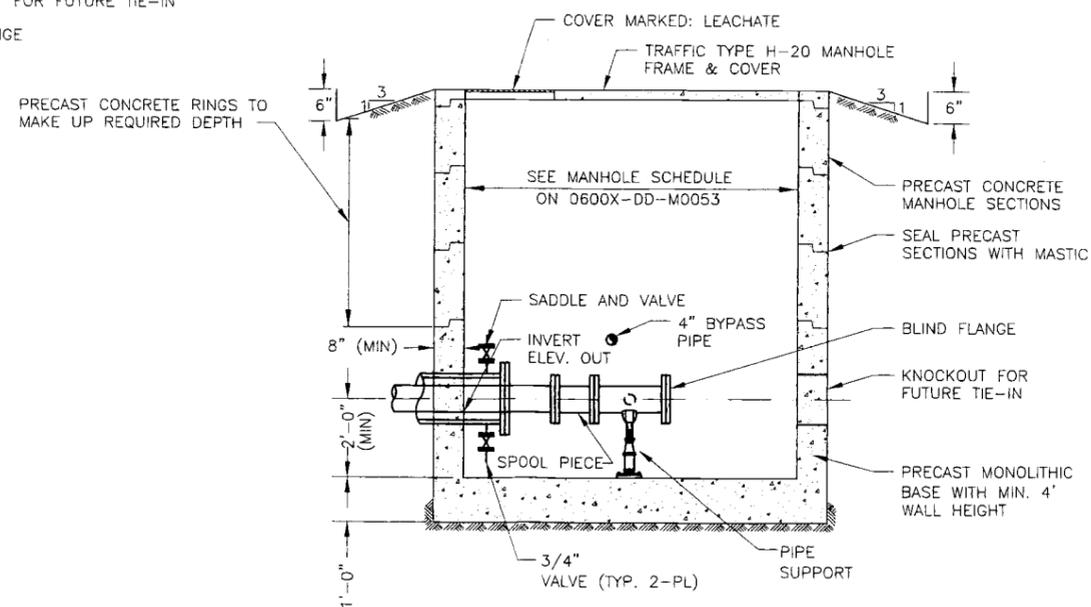
WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPERVISOR/CONTRACTOR DOCUMENT STATUS STAMP			
<input type="checkbox"/>	Work may proceed	<input type="checkbox"/>	Final
<input type="checkbox"/>	Review and approve. Work may proceed prior to resubmission.	<input type="checkbox"/>	Final
<input type="checkbox"/>	Review and approve. Work may proceed prior to resubmission subject to resolution of indicated comments.	<input type="checkbox"/>	Final
<input type="checkbox"/>	Review and approve. Work may proceed.	<input type="checkbox"/>	Final
<input type="checkbox"/>	Permit/allowance required.	<input type="checkbox"/>	Final
<small>Permission to proceed does not constitute acceptance or approval of design details, calculations, drawings, test methods, or material developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contractual obligations to release any "hold" placed on the contract.</small>			
DATE	BY	DATE	BY
11-23-2009	WA	11-23-2009	WA
DOCUMENT ID NUMBER		5069524400003.05014 056	



(B) SECTION



PLAN



(A) SECTION

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NOV 23 2009
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REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT	CHK	ENGR	CHK	SYS	ENGR	PROJ	ENGR
0	11/23/09	ISSUED FOR AWARD									

SCALE: AS SHOWN
U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

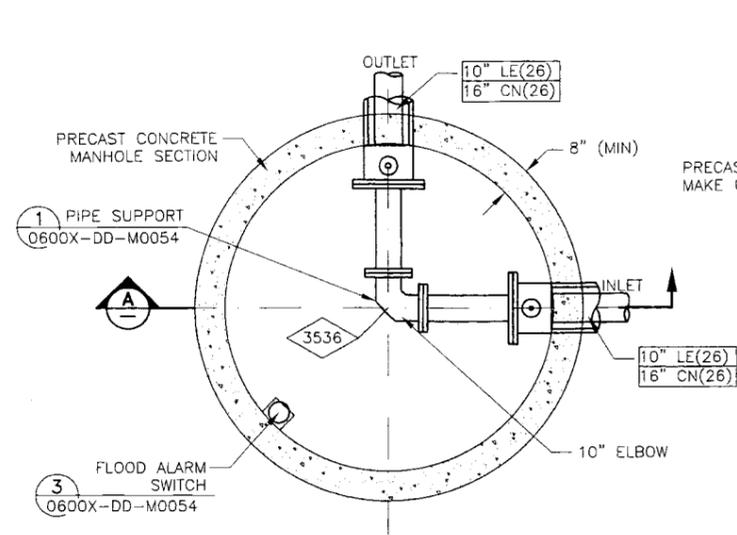
WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS LLC DENVER, CO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
MANHOLE DETAILS - 1

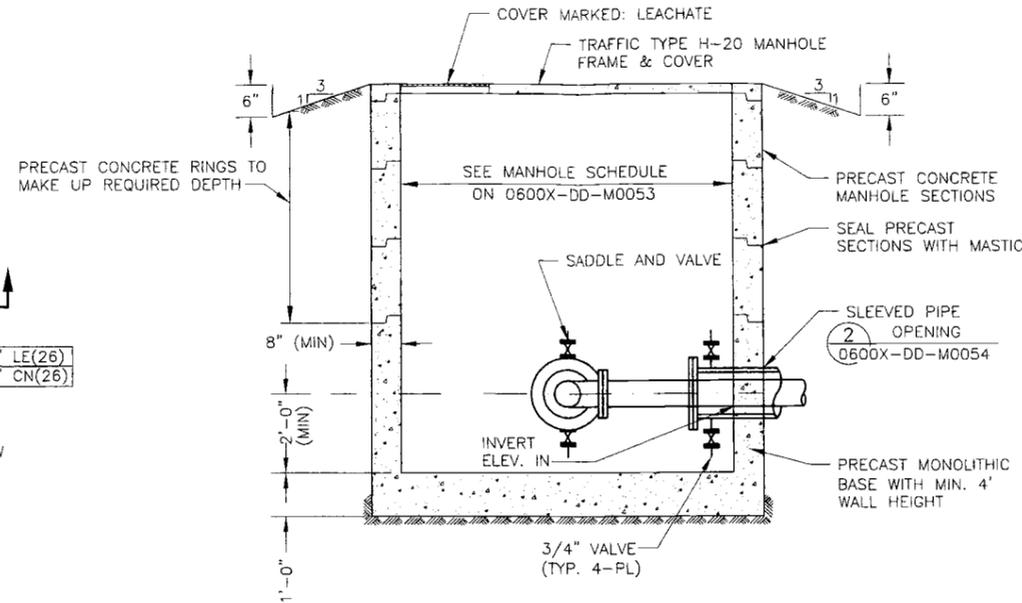
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDM0057.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-M0057	0

1 MANHOLE 32 PRIOR TO CELL 10 TIE-IN, MANHOLE 33
0600X-DD-C0466 NTS

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16380 SHT01	600G	9901



PLAN



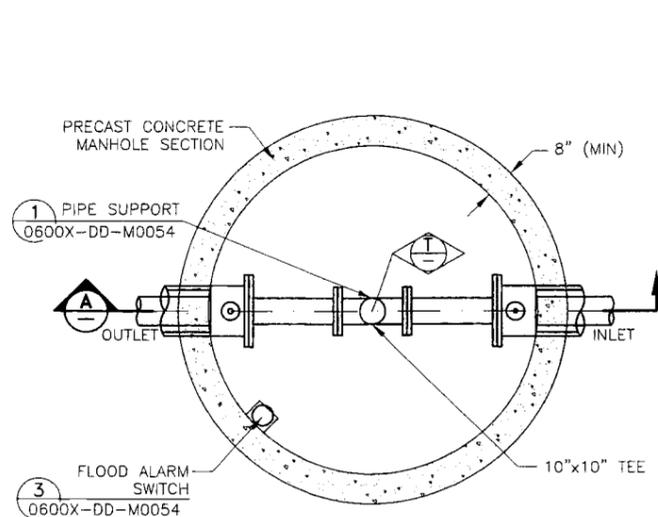
SECTION A

1 MANHOLE 38
0600X-DD-C0467,C0468 NTS

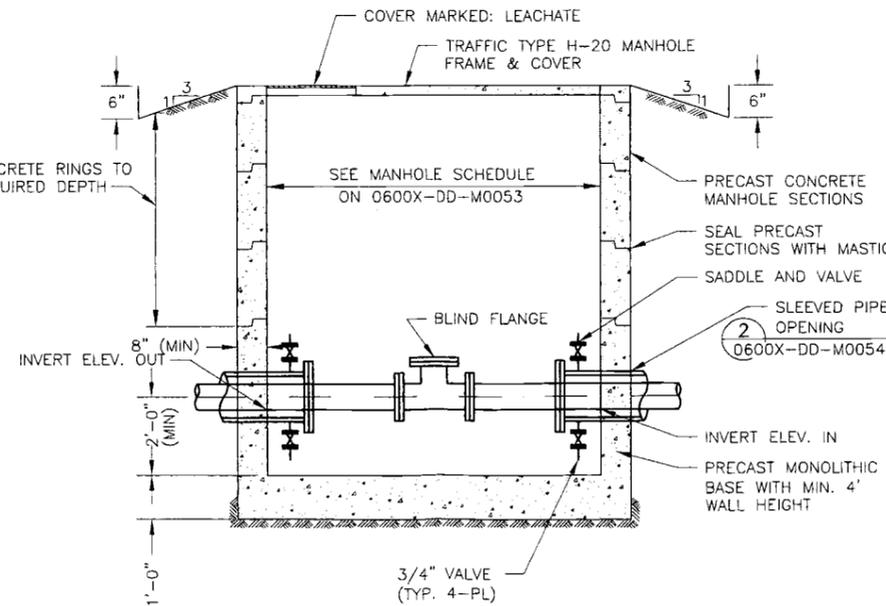
1. ALL JOINTS ARE FUSION WELDED UNLESS SHOWN OTHERWISE.
2. PROVIDE PIPE SUPPORTS AS PER MANUFACTURER'S RECOMMENDATIONS.
3. CONTRACTOR SHALL USE THE SMALLEST PIPE SEGMENTS POSSIBLE FOR FABRICATING FITTINGS.
4. SECONDARY CONTAINMENT AND PENETRATION DETAILS NOT SHOWN.
5. MANHOLE COORDINATE LOCATION IS AT INTERSECTION OF PIPES. SEE MANHOLE SCHEDULE ON 0600X-DD-M0053.
6. PROVIDE INDIVIDUAL RUNG LADDER OR FIXED LADDER CONFORMING TO OSHA REQUIREMENTS.
7. VENTS AND DRAINS SHALL BE INSTALLED ON ALL CONTAINMENT PIPES IN MANHOLE.
8. SEE MANHOLE SCHEDULE, DRAWING 0600X-DD-M0053 FOR PIPING ELEVATIONS.

DOCUMENT CONTROL *Dr. H. J. 10/29/09*

- MANHOLE COORDINATES
1. FOR MH-34, COORDINATE NUMBER IS 3532.
 2. FOR MH-35, COORDINATE NUMBER IS 3533.
 2. FOR MH-36, COORDINATE NUMBER IS 3534.
 2. FOR MH-37, COORDINATE NUMBER IS 3535.



PLAN



SECTION A

2 MANHOLE 34, 35, 36 & 37
0600X-DD-C0467,C0468 NTS

RECEIVED
NOV 23 2009
WCH - DOCUMENT CONTROL

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR EQUIPMENT STATUS STAMP			
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<input type="checkbox"/>	3. Check log accurate.	<input type="checkbox"/>	4. Check log readable.
<input type="checkbox"/>	5. Check log legible.	<input type="checkbox"/>	6. Check log complete.
<input type="checkbox"/>	7. Check log accurate.	<input type="checkbox"/>	8. Check log readable.
<input type="checkbox"/>	9. Check log legible.	<input type="checkbox"/>	10. Check log complete.
Permission to proceed does not constitute acceptance or approval of design, construction, analysis, test methods, or materials developed or selected by the supplier/contractor and does not release the supplier/contractor from full compliance with contractual obligations or release any liability placed on the contract.			
DATE	TIME	DATE	TIME
11-23-2009	11:23	11-23-2009	11:23
DRAWN BY: W.A. B...		CHECKED BY: ...	
DOCUMENT NUMBER: S66X524R00C03-05-014-057		SCALE: AS SHOWN	



REV.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	DATE	TIME
1	11/23/09	ISSUED FOR AWARD	W.A. B...

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS LLC
DENVER, CO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
MANHOLE DETAILS - 2

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDM0058.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-M0058	0

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16381 SHT01	600G	9901

DRAWING NO.	REV. NO.	PLAN
0600X-DD-E0216	0	
—	GROUND BUS	
—	EXPOSED CONDUIT	
—	CONDUIT CONCEALED ABOVE FLOOR.	
—	CONDUIT RUN UNDERGROUND OR IN CONCRETE	
—	EXPOSED CONDUIT RUN BEHIND OBSTRUCTION	
—	BARE COPPER GROUND TO GROUND WIRE IN SLAB, OR UNDERGROUND GROUND GRID, SIZE AS NOTED.	
①	UNDERGROUND TELEMETRY CONDUIT	
LP-T1-1, 3, 5	HOME RUN TO PANEL "LP-T1", CIRCUITS #1, 3, 5. CONDUCTORS SHALL BE NO. 12 UNLESS OTHERWISE NOTED. CONDUIT SHALL BE 3/4", UNLESS OTHERWISE NOTED. CONDUIT SIZES NOT IDENTIFIED SHALL BE 3/4" MINIMUM WITH 2#12, 1#12G. G INDICATES GROUND WIRE.	
T	TELEPHONE CONDUIT ONLY. "UNLESS OTHERWISE NOTED".	
—	CONDUIT RUN - CHANGE IN ELEVATION	
—	CONDUIT BENDS TOWARD OBSERVER	
—	CONDUIT BENDS AWAY FROM OBSERVER	
—	CONDUIT CAPPED, OR SEALED	
C135	FLEXIBLE LIQUID - TIGHT CONDUIT CONNECTION INDICATES CONDUIT NUMBER	
2a	CEILING OR PENDANT INCANDESCENT, HIGH PRESSURE SODIUM, OR SIMILAR LAMP LUMINAIRE. "2" INDICATES CIRCUIT NUMBER. "a" INDICATES LUMINAIRE CONTROLLED BY SWITCH "a".	
—	WALL BRACKET INCANDESCENT, HIGH PRESSURE SODIUM, OR SIMILAR LAMP LUMINAIRE WITH EXPOSED BACK BOX AND CONDUIT.	
—	WALL BRACKET FLOOD OR SPOTLIGHT WITH CONCEALED BACK BOX AND CONDUIT.	
—	POLE MOUNTED LUMINAIRE DISTRIBUTION TYPE AS INDICATED ON PLAN	
A 2/34	LUMINAIRE TYPE A. 2-34 WATT LAMPS 3 - NUMBER OF TYPE "A" FIXTURES	
—	FLUORESCENT LUMINAIRE, UNSWITCHED (SWITCHED AT LIGHTING PANEL ONLY)	
—	FLUORESCENT LUMINAIRE ON EMERGENCY CIRCUIT	
—	FLUORESCENT LUMINAIRE	
—	BATTERY EMERGENCY LUMINAIRE	
S _o	SINGLE POLE SWITCH. "o" INDICATES CIRCUIT CONTROLLED	
S ₂	DOUBLE POLE SWITCH	
S ₃	THREE-WAY SWITCH	
S ₄	FOUR-WAY SWITCH	
S _K	KEY-OPERATED SWITCH	
S _P	SWITCH AND PILOT LIGHT	
S _M	MANUAL MOTOR STARTER	
WALL FLOOR	120V SINGLE RECEPTACLE, NEMA CONFIGURATION 5-20.	
—	120V DUPLEX RECEPTACLE, NEMA CONFIGURATION 5-20	

⊕	240V SINGLE RECEPTACLE, NEMA CONFIGURATION 6-20
⊕	WELDING RECEPTACLE, 100A, 2W, 3P MOUNT 42" ABOVE FLOOR
⊕	SINGLE SPECIAL PURPOSE RECEPTACLE 480 VAC
⊕	CLOCK HANGER RECEPTACLE
⊕	LIGHTING PANEL
⊕	POWER PANEL
⊕	MOTOR CONTROL CENTER
⊕	FLOOR TYPE TELEPHONE OUTLET
⊕	PUBLIC TELEPHONE SYSTEM DEVICE
⊕	PRIVATE TELEPHONE (ANY TYPE) SYSTEM DEVICE
⊕	DISCONNECT SWITCH
⊕	MOTOR STARTER
⊕	MOTOR
⊕	PUSHBUTTON STATION "SS" START-STOP, "LOS" LOCKOUT-STOP, "SLOS" START-LOCKOUT-STOP
⊕	RACEWAY BOX "HH" HANDHOLE "JB" JUNCTION BOX "PB" PULLBOX "TB" TERMINAL BOX
⊕	JUNCTION BOX OR FITTING
⊕	FIELD INSTRUMENT I.E. "PSL" PRESSURE SWITCH "LSH" LEVEL SWITCH "SV" SOLENOID VALVE
⊕	SOLENOID VALVE
⊕	THERMOSTAT
⊕	HEATER
⊕	HORN
⊕	DENOTES REFERENCE TO NOTE 1 I.E. - "SEE NOTE 1"
⊕	GROUND ROD 3/4" x 10" - 0" (UNLESS OTHERWISE NOTED)
⊕	GROUND ROD AND GROUND TEST WELL
⊕	GROUND CONNECTION BOLTED TYPE
⊕	GROUND CONNECTION - EXOTHEMIC TYPE
⊕	MOTOR OPERATED VALVE

ONE LINE DIAGRAM	
—	BUS
—	ACROSS-THE-LINE, NON-REVERSING NEMA SIZE 2 MAGNETIC STARTER
—	CONTACTOR, SIZE AS NOTED
—	MOLDED CASE CIRCUIT BREAKER, 3 POLE UNLESS OTHERWISE NOTED: 50A.-TRIP RATING IN AMPERE NA- NON-AUTOMATIC MCP - MOTOR CIRCUIT PROTECTOR AT-TRIP RATING (125 AMPS NOTED)
—	MEDIUM OR HIGH VOLTAGE DRAWOUT BREAKER
—	DRAWOUT BREAKER, SIZE AS NOTED EO - DENOTES ELECTRICALLY OPERATED
—	MEDIUM OR HIGH VOLTAGE STARTER
—	SURGE ARRESTOR
⊕	MOTOR - 10 HP NOTED

—	480/120V TRANSFORMER WITH GROUNDED SECONDARY, KVA SIZE & VOLTAGE RATIO AS NOTED.
—	POTENTIAL TRANSFORMER, RATIO AND NUMBER OF PT'S AS NOTED
—	CURRENT TRANSFORMER, RATIO AND NUMBER OF CT'S AS NOTED
—	ELECTRICAL INTERLOCK
—	ELECTRICAL ENCLOSURE OUTLINE
—	ELECTRICAL MOTOR OPERATED VALVE, WITH INTEGRAL REVERSING STARTER
—	DISCONNECT SWITCH, SIZE AS NOTED
—	FUSED DISCONNECT SWITCH
—	CAPACITOR, KVAR AS NOTED
—	KILOWATT HOUR METER WITH DEMAND REGISTER
—	AMMETER
—	VOLTMETER
—	POWER FACTOR METER
—	VAR METER
—	AMMETER SWITCH
—	VOLTMETER SWITCH

SCHEMATIC DIAGRAM	
—	CONTROL RELAY OR COIL
—	EXAMPLE: TD2 TIME DELAY RELAY NO. 2 CR1 CONTROL RELAY 1M STARTER NO. 1 MAIN COIL
—	N.O. CONTACT
—	N.C. CONTACT
—	TORQUE SWITCH (SPECIFY WHEN OPEN)
—	NORMALLY OPEN LIMIT SWITCH
—	NORMALLY CLOSED LIMIT SWITCH
—	FLOAT TYPE LIQUID LEVEL SWITCH, CLOSING ON RISING LEVEL
—	FLOAT TYPE LIQUID LEVEL SWITCH, OPENING ON RISING LEVEL
—	VACUUM OR PRESSURE SWITCH, CLOSING ON RISING PRESSURE
—	VACUUM OR PRESSURE SWITCH, OPENING ON RISING PRESSURE
—	TEMPERATURE ACTUATED SWITCH; CLOSING ON RISING TEMPERATURE
—	TEMPERATURE ACTUATED SWITCH; OPENING ON RISING TEMPERATURE
—	FLOW SWITCH (AIR, WATER, ETC.); CLOSING ON FLOW INCREASE
—	FLOW SWITCH (AIR, WATER, ETC.); OPENING ON FLOW INCREASE
—	NORMALLY OPEN PUSHBUTTON, MOMENTARY CLOSE
—	NORMALLY CLOSED PUSHBUTTON, MOMENTARY OPEN

—	NO/NC MAINTAINED PUSHBUTTON
—	TWO-POSITION SELECTOR SWITCH: H-HAND, M-MANUAL, R-REMOTE, L-LOCAL, A-AUTOMATIC, O-OFF
—	THREE-POSITION SELECTOR SWITCH. (SAME AS ABOVE)
—	THREE-POSITION SPRING RETURN-TO-CENTER MOMENTARY CONTACT SWITCH ("LATCH-UNLATCH," "ON-OFF," ETC.)
—	SINGLE POLE TOGGLE SWITCH ("ON-OFF", ETC.)
—	OVERLOAD RELAY CONTACTS (MAGNETIC)
—	TIMED CONTACTS - CONTACT ACTION DELAYED AFTER COIL IS: ENERGIZED
—	NORMALLY OPEN WITH TIME DELAY CLOSING
—	NORMALLY CLOSED WITH TIME DELAY OPENING
—	NORMALLY OPEN WITH INSTANT CLOSING AND TIME DELAY OPENING
—	NORMALLY CLOSED WITH INSTANT OPENING AND TIME DELAY CLOSING
—	MANUAL MOTOR STARTER WITH OVERLOAD PROTECTION
—	FUSE
—	RESISTOR (FIXED) POTENTIOMETER TYPE
—	RESISTOR (CONTINUOUSLY ADJUSTABLE)
—	PUSH-TO-TEST INDICATING LIGHT
—	ELAPSED TIME METER
—	HEATER
—	CROSSING OF CONDUCTORS-NOT CONNECTED
—	CONNECTION OF CONDUCTORS, FITTING AS REQUIRED
—	DISCONNECT SWITCH
—	GROUND CONNECTION
—	SURGE SUPPRESSOR
—	ELECTRICAL CORD CONNECTOR
—	INDICATING LIGHT G - GREEN R - RED A - AMBER
—	SIGNAL ISOLATOR
—	MOTOR

NOTES

- THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS DRAWING AND NOT ON THE PLANS.
- FOR ADDITIONAL ABBREVIATIONS OF OTHER DIVISIONS, SEE OTHER LEGENDS.

WASHINGTON CLOSURE CONTRACT DOCUMENT STATUS STAMP

1. Work may proceed
 2. Review and rework Work may proceed prior to resubmission
 3. Review and rework Work may proceed prior to resubmission subject to resolution of Advanced concerns
 4. Review and rework Work may proceed
 5. Permission to proceed not required

Permission to proceed does not constitute acceptance or approval of design details, quantities, analysis, test methods, or materials developed or selected by the subcontractor and does not relieve the subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.

NO.	DATE	BY	REVISION
1	11-23-2009	W.A. Calver	ISSUED FOR AWARD

RECEIVED
NOV 21 2009
WCH - DOCUMENT CONTROL

DOCUMENT CONTROL No. 1124109

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
1	11/23/09	ISSUED FOR AWARD						

SCALE: NA

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON	WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO
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ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9-10
ELECTRICAL SYMBOLS

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDE0216.DWG
TASK ERDF	DRAWING NO. 0600X-DD-E0216	REV. NO. 0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16457 SHT01	600G	8802

A B B R E V I A T I O N S

G E N E R A L N O T E S

Table of abbreviations: A AMPERE, AUTO, AMMETER, AMP; AC ALTERNATING CURRENT; A/C AIR CONDITIONING; AF AMPERE FRAME SIZE OF CKT. BREAKERS; AFF ABOVE FINISHED FLOOR; AL ALUMINUM; AM AMMETER; ANN ANNUNCIATOR; AMP AMPERES, AMPERAGE; APPR APPROVED; AS AMMETER SWITCH, ADJUSTABLE SPEED; AT AMPERE TRIP; ATS AUTOMATIC TRANSFER SWITCH; AUTO AUTOMATIC; AWG AMERICAN WIRE GAUGE; BATT BATTERY; BKR BREAKER; BBL BUBBLER; BLDG BUILDING; C CONDUIT, CLOSED; CAB CABINET; CB CIRCUIT BREAKER; CKT CIRCUIT; CO CONDUIT ONLY; COND CONDUIT; COMPT COMPARTMENT; COMPR COMPRESSOR; CP CONTROL PANEL; CPT CONTROL POWER TRANSFORMER (IN INDIVIDUAL STARTER CUBICLE); CR CONTROL RELAY (MAGNETICALLY HELD); CT CURRENT TRANSFORMER; CU COPPER; DC DIRECT CURRENT; DH DATA HIGHWAY; DISC DISCONNECT; DISTR DISTRIBUTION; DPOT DOUBLE POLE DOUBLE THROW; DWG DRAWING; E EMPTY, EMERGENCY; ELEV ELEVATION; EMERG EMERGENCY; EMT ELECTRICAL METALLIC TUBING; ENCL ENCLOSURE; EP EXPLOSION PROOF; EQPT EQUIPMENT; ER CONDUCTANCE LEVEL RELAY; ETM ELAPSED TIME METER; EXH EXHAUST; EXIST EXISTING; FI FLOW INDICATOR; F FREQUENCY; FDR FEEDER; FLEX FLEXIBLE; FLUOR FLUORESCENT; FM FREQUENCY METER; FUT FUTURE; FVR FULL VOLTAGE REVERSING; FVNR FULL VOLTAGE NON-REVERSING; FWD FORWARD CONTACTOR COIL; GALV GALVANIZED; GEN GENERATOR;

Table of abbreviations: HIGH HIGH SPEED CONTACTOR; HOA HAND - OFF - AUTOMATIC; HP HORSE POWER; HPS HIGH PRESSURE SODIUM; HTR HEATER; HVAC HEATING VENTILATION AIR CONDITIONING; HZ HERTZ; INCAND INCANDESCENT; IND INDICATION (SYSTEM); I/O INPUT/OUTPUT; INST INSTANTANEOUS (TD CONTACT); INSTR INSTRUMENT; Isc SHORT CIRCUIT CURRENT, AMPS; J BOX JUNCTION BOX; JB JUNCTION BOX; KCMIL ONE THOUSAND CIRCULAR MILLS; KVA KILO (1000) VOLT AMPS; KW KILOWATTS; KWH KILOWATT HOUR; LC LIGHTING CONTACTOR; LCB LOCAL CONTROL BOARD; LCP LOCAL CONTROL PANEL; LOC LOCAL; LOS PUSHBUTTON W/"LOCK-OUT-STOP"; LS LEVEL SWITCH; LT, LTS LIGHT, LIGHTS; LTG LIGHTING; LOW LOW SPEED CONTACTOR; M MOTOR CONTACTOR COIL, MOTOR; MA MILLIAMPS; MAN MANUAL; MAG MAGNETIC; MAX MAXIMUM; MCC MOTOR CONTROL CENTER; MCB MAIN CONTROL BOARD; MCP MOTOR CIRCUIT PROTECTOR; MD MOTORIZED DAMPER; MH MANHOLE; MIN MINUTES, MINIMUM; MLO MAIN LUGS ONLY; MOV MOTOR OPERATED VALVE; MS MANUAL MOTOR STARTER; MT, MTD MOUNT, MOUNTED; MTR MOTOR; MUX MULTIPLEXING PANEL; N NEUTRAL; NA NON-AUTOMATIC; NC NORMALLY CLOSED; NO, NOS NUMBER, NUMBERS, NORMALLY OPEN; NP NAMEPLATE; NEC NATIONAL ELECTRICAL CODE; NIC NOT IN CONTRACT; NITS NOT IN THIS SECTION; NTS NOT TO SCALE; O OPEN; OC ON CENTER; CC CENTER TO CENTER; OL OVERLOAD RELAY; P POLE; PB PUSHBUTTON, PULLBOX; PCM PROCESS CONTROL MODULE; PCP PROCESS CONTROL PANEL; PF POWER FACTOR; PH PHASE; PNL PANEL; PNLBD PANELBOARD;

Table of abbreviations: POS POSITION; POT POTENTIOMETER; PRI PRIMARY; PS PRESSURE SWITCH; PT POTENTIAL TRANSFORMER; PVC POLYVINYL CHLORIDE; PW PART WINDING; PWR POWER; REC RECEPTACLE; RECPTS RECEPTACLES; REQ'D REQUIRED; REV REVERSE CONTACTOR COIL; RGS RIGID GALVANIZED STEEL; RUN RUN CONTACTOR COIL; RTU REMOTE TERMINAL UNIT; RVAT REDUCED VOLTAGE AUTO-TRANSFORMER; RVNR REDUCED VOLTAGE NON-REVERSING; SCH SCHEDULE; SEC SECONDS, SECONDARY; SECT SECTION; SEL SW SELECTOR SWITCH; SEQ SEQUENCE; SHLD SHIELDED; SHT SHEET; SIG SIGNAL; S1, S2 START CONTACTOR COILS; SP SPARE; SPOT SINGLE POLE DOUBLE THROW; SPECS SPECIFICATIONS; SP HTR SPACE HEATER; SPST SINGLE POLE SINGLE THROW; ST, SH SHUNT TRIP; STA STATION; STD STANDARD; STL STEEL; STR STARTER; SV SOLENOID VALVE; SW SWITCH; SYS SYSTEM; T TRANSFORMER; TB TERMINAL BOX; TC TIME CLOCK; TACH TACHOMETER; TEMP TEMPERATURE; TERM TERMINAL; TH THERMOSTAT; TM REPEAT CYCLE TIMER; TD TIME DELAY RELAY; TR TIMER; TS TEMPERATURE SWITCH; TYP TYPICAL; UG UNDERGROUND; UH UNIT HEATER; US UNIT SUBSTATION; UST UNIT SUBSTATION TRANSFORMER; V VOLTAGE, VOLTS; VAR VAR METER; VFD VARIABLE FREQUENCY DRIVE; VSD VARIABLE SPEED DRIVE (OTHER THAN VFD); VP VAPORPROOF; VS VARIABLE SPEED, VOLTMETER SWITCH; W WATTS, WIRE; WHD WAITHOUR DEMAND METER; WHM WAITHOUR METER; WP WEATHERPROOF; XD TRANSDUCER; XFMR TRANSFORMER; XMTR TRANSMITTER;

RACEWAY

- 1. ALL CONDUIT AND CABLE RUNS ARE SHOWN DIAGRAMMATICALLY AND THEY SHALL BE ROUTED TO SUIT FIELD CONDITIONS.
2. THE SUBCONTRACTOR SHALL VERIFY EXACT LOCATION OF TERMINAL BOXES AND CONDUIT ENTRANCES OF ALL EQUIPMENT AGAINST SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.
3. CONNECTION BETWEEN RIGID CONDUIT AND MOTOR TERMINAL BOX SHALL BE LIQUID TIGHT FLEXIBLE CONDUIT.
4. CONDUIT TERMINATING AT SWITCHBOARD, MOTOR CONTROL CENTER, POWER AND LIGHTING PANEL, CONTROL CABINET, ETC. SHALL BE EQUIPPED WITH GROUNDING BUSHING AND SHALL BE GROUNDED WITH THE APPROPRIATE GROUNDING CONDUCTOR PER THE 2008 NEC IF CONDUIT IS EMT OR RMC.
5. INSTALL EXPANSION FITTINGS EVERY 200 FEET OF STRAIGHT RUN OF ABOVE GROUND CONDUITS AND CABLE TRAYS.
6. CONDUIT FITTINGS AND SUPPORTS ARE NOT SHOWN ON THE DRAWINGS. THE SUBCONTRACTOR SHALL PROVIDE ALL FITTINGS AND SUPPORT REQUIRED TO SUIT THE CONDITIONS.
7. THE SUBCONTRACTOR SHALL LIMIT THE NUMBER OF BENDS TO (3)-90 DEGREES BETWEEN ALL POINTS.
8. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SLEEVES AND OPENINGS REQUIRED FOR THE PASSAGE OF ELECTRICAL RACEWAYS OR CABLES EVEN WHEN THESE OPENINGS OR SLEEVES ARE NOT SPECIFICALLY SHOWN ON THE DRAWINGS.
9. PROVIDE FLEXIBLE CONDUIT WHERE RIGID CONDUIT TERMINATES AT EQUIPMENT OR WHEN DEVICES ARE SUBJECT TO MOVEMENT FROM VIBRATION, EXPANSION OR CONTRACTION.
10. ALL UNDERGROUND CONDUIT RUNS SHALL BE WITH LONG RADIUS SWEEP BENDS. THE MINIMUM BENDING RADIUS SHALL BE 12 TIMES NOMINAL DIAMETER OF THE CONDUIT, AND NO FACTORY BENDS SHALL BE PERMITTED.
11. ALL UNDERGROUND CONDUITS NOT ENCASED IN CONCRETE SHALL BE PVC SCHEDULE 80, GALVANIZED RMC, PVC COATED RMC UNLESS OTHERWISE NOTED.
12. THE MINIMUM SIZE OF CONDUITS INSTALLED BELOW GRADE SHALL BE 1" UNLESS OTHERWISE NOTED.
13. THE MINIMUM SIZE OF CONDUIT INSTALLED ABOVE GRADE SHALL BE 3/4" UNLESS OTHERWISE NOTED.
14. ALL SPARE OR UN-USED CONDUIT SHALL BE PROVIDED WITH A 3/8" NYLON PULL CORD.
15. ALL UNDERGROUND CONDUIT (EXCEPT SINGLE CONDUIT RUNS) SHALL BE CONCRETE ENCASED UNLESS NOTED OTHERWISE.

GROUNDING

- 1. ALL METALLIC STRUCTURES, METALLIC ENCLOSURES, AND ELECTRICAL EQUIPMENT, SUCH AS STRUCTURAL STEEL, METALLIC RACEWAY, FENCE, STAIR HANDRAILS, LIGHTING POLE, TANK, VESSELS, SWITCHING EQUIPMENT, PANEL, EQUIPMENT ENCLOSURE AND CABINETS GENERATOR, MOTOR, TRANSFORMER, SWITCHGEAR, ETC. SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED AND GROUND CONNECTION SHALL BE MADE TO THE PLANT GROUND GRID. THE GROUND CONDUCTOR SHALL BE SIZED PER N. E. C. UNLESS OTHERWISE SHOWN.
2. GROUNDING CONDUCTOR STUB-UP AND INSERT LOCATION ARE APPROXIMATE ONLY. THE SUBCONTRACTOR SHALL USE HIS BEST JUDGEMENT FOR CORRECT LOCATIONS IN FIELD.
3. ALL GROUND CONDUCTORS SHALL BE #4/0 SIZE UNLESS OTHERWISE NOTED.
4. ALL GROUND CONDUCTORS SHALL BE BARE, COPPER, STRANDED UNLESS OTHERWISE NOTED.
5. ALL GROUNDING CONDUCTORS SHALL BE MINIMUM OF 18" BELOW GRADE EXCEPT UNDER BUILDING SLAB WHEN THEY SHALL BE MINIMUM OF 6" BELOW SLAB.

WIRING

- 1. ALL WIRING SIZES SHALL BE AWG UNLESS OTHERWISE NOTED.

EQUIPMENT AND DEVICES

- 1. LOCATIONS OF EQUIPMENT, CONTROL DEVICES, INSTRUMENTS, BOXES, PANELS, ETC ARE APPROXIMATE ONLY, AND PROPER JUDGEMENT MUST BE EXERCIZED IN EXECUTING THE WORK TO INSURE THE BEST POSSIBLE INSTALLATION.
2. PACKAGE EQUIPMENT: SOME CONDUITS AND WIRES ARE SHOWN ON THE DRAWINGS, BUT IT IS EXPECTED THAT SOME ADDITIONAL CONDUITS AND WIRES MAY BE REQUIRED BY EQUIPMENT MANUFACTURERS TO COMPLETE INSTALLATION. IT IS INCUMBENT UPON THE CONTRACTOR TO COORDINATE THIS REQUIREMENT TO MAKE SURE THAT EQUIPMENT SUPPLIER PROVIDES ALL NECESSARY ELECTRICAL INFORMATION FOR INCLUSION OF COSTS IN BID PACKAGE. ALL NECESSARY MATERIALS AND LABOR TO COMPLETE ELECTRICAL INSTALLATION SHALL BE PROVIDED WHETHER SHOWN OR NOT SHOWN ON THE DRAWINGS. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL CODES AND STANDARDS PER SPEC. 0600X-SP-E0025.
3. ALL EQUIPMENT DIMENSIONS SHOWN ON PLANS AND ELEVATIONS ARE APPROXIMATE ONLY. THE SUBCONTRACTOR SHALL USE SHOP DRAWINGS FOR PROPER LAYOUT, FOUNDATION AND PAD, ETC. FOR FINAL INSTALLATION WITHOUT ANY ADDITIONAL COST TO THE CONTRACTOR.
4. SWITCHGEAR, SWITCHBOARD, MOTOR CONTROL CENTER AND ALL FREE STANDING PANELS SHALL BE SET ON CONCRETE PAD AND LEVELING CHANNELS EMBEDDED IN THE PAD UNLESS OTHERWISE NOTED.

SCHEMATIC DIAGRAMS

- 1. ALL CONTROLS ARE SHOWN DE-ENERGIZED IN ACCORDANCE WITH ANSI C37.2.
2. ALL CONTROL DIAGRAMS SHOW CONTROL FUNCTION ONLY. SUBCONTRACTOR SHALL INCORPORATE OTHER NECESSARY FUNCTIONS FOR PROPER OPERATIONS AND PROTECTION ON THE SYSTEM.
3. SLAVE RELAY SHALL BE ADDED WHERE REQUIRED TO PROVIDE ALL NECESSARY CONTACTS FOR THE SCHEMATIC DIAGRAMS SHOWN.
4. ALL DEVICES SHOWN ON MOTOR STARTER SCHEMATIC DIAGRAMS SHALL BE MOUNTED IN THE MOTOR STARTER CUBICLES UNLESS OTHERWISE NOTED.
5. ALL DEVICES SHOWN IN THE CONTROL PANEL OR CABINET SHALL BE MOUNTED IN THE CONTROL PANEL OR CABINET UNLESS OTHERWISE NOTED.

MISCELLANEOUS

- 1. IN CASE OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND THE OTHER EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER IN WRITING AND THE CONTRACTOR SHALL REVIEW THE PROPOSED CHANGES BEFORE THEY ARE MADE.
2. ALL OUTDOOR DEVICES SHALL BE NEMA 4 RATED.
3. LOCATION OF MANHOLES AND PULLBOXES ARE APPROXIMATE. SUBCONTRACTOR SHALL COORDINATE EXACT LOCATION OF MANHOLES AND PULLBOXES WITH MECHANICAL AND CIVIL WORK.
4. SUBCONTRACTOR SHALL PROVIDE ADDITIONAL PULL BOXES TO THOSE SHOWN WHERE THEY ARE REQUIRED TO MAKE A WORKABLE INSTALLATION.
5. CIRCUITS OF DIFFERENT SERVICE VOLTAGE SHALL BE INSTALLED IN SEPARATE RACEWAYS, MANHOLES, HANDHOLES, PULLBOXES AND JUNCTION BOXES. THE VOLTAGE AND SERVICE LEVELS ARE:
(1) 12KV, 13.8KV
(2) 120V-480VOLT
(3) INSTRUMENTATION LESS THAN 50VDC
(4) TELEPHONE AND COMMUNICATIONS.

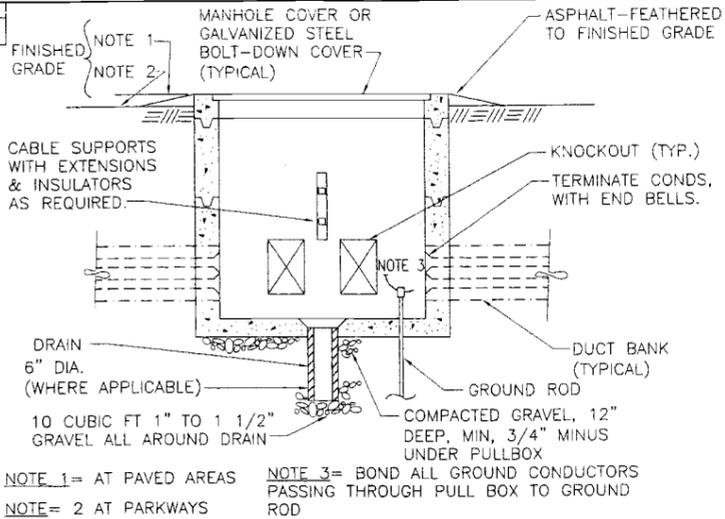
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2. Review and rework. Work may proceed prior to re-issuance
3. Review and rework. Work may proceed after re-issuance of indicated comments
4. Review and rework. Work may not proceed
5. Permission is granted not required
Permitted to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "hold" placed on the contract.

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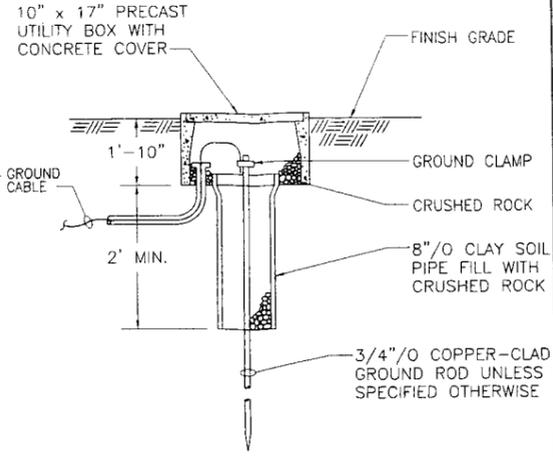


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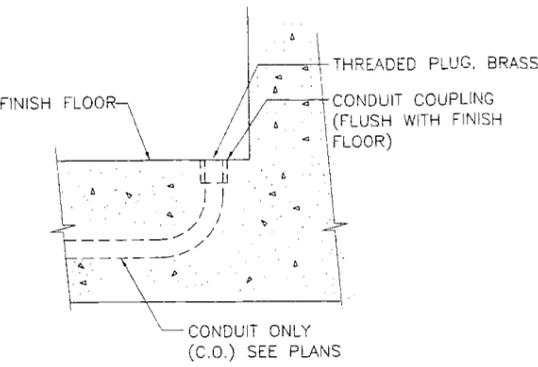
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DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT
WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY CELLS 9 - 10
ELECTRICAL ABBREVIATIONS AND GENERAL NOTES
WCH JOB NO. 14655, DOE CONTRACT NO. DE-AC06-05RL-14655, CADD FILENAME 6XDE0217.DWG
TASK ERDF, DRAWING NO. 0600X-DD-E0217, REV. NO. 0
RECORD INFORMATION: RECORD NO. H-6-16458 SHT01, BLDG NO. 600G, INDEX NO. 8802



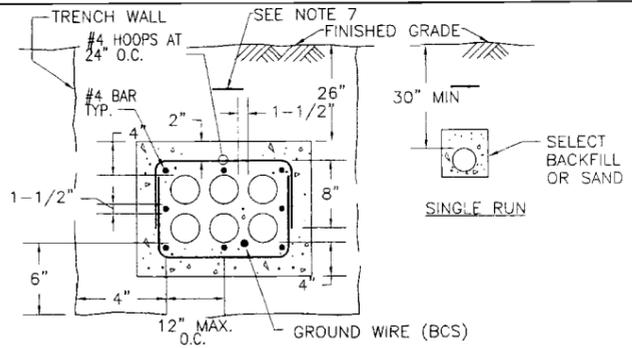
1 TYPICAL PULLBOX
0600X-DD-C0465,E0221,E0222 NTS



2 GROUND ROD AND WELL
0600X-DD-E0229 NTS

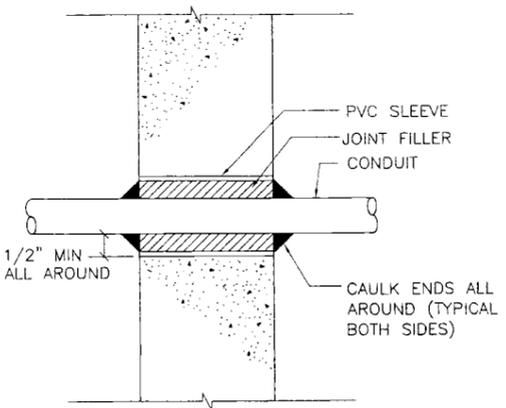


3 CONDUIT TERMINATION FOR FUTURE EQUIP
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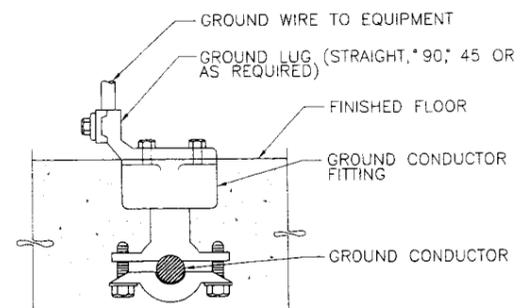


- NOTES:**
- COLOR OF CONCRETE ENCASUREMENT PER SPECS.
 - TRENCH FOR DUCT BANK SHALL BE MADE MIN. 2" WIDER ON EACH SIDE AND 2" DEEPER THAN DUCT BANK.
 - ALL EARTH THAT FALLS BETWEEN AND BELOW CONDUIT WITHIN DUCT BANK AREA SHALL BE REMOVED BEFORE CONCRETE IS POURED AROUND DUCTS.
 - SUPPORT CONDUIT AT BOTTOM OF TRENCH ON 6" BLOCK TO ALLOW POURED CONCRETE TO FULLY ENCASE CONDUIT AND REBAR.
 - PROVIDE REBAR ONLY WHERE DUCTS ROUTE UNDER ROAD, HEAVY WORK AREA OR AS DEFINED.
 - NUMBER OF CONDUITS IN DUCT BANK VARIES; GROUND WIRES ARE NOT REQUIRED FOR ALL DUCT BANKS. SEE DUCT BANK SCHEDULE.
 - PLASTIC, MAGNETIC 3" WIDE DETECTOR TAPE, BURIED 16" MINIMUM BELOW GRADE.

4 TYPICAL DUCT BANK
0600X-DD-E0220,E0221,E0222 NTS

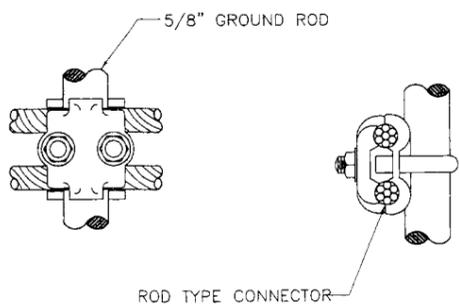


5 CONDUIT PENETRATION AT NEW WALL OR SLAB
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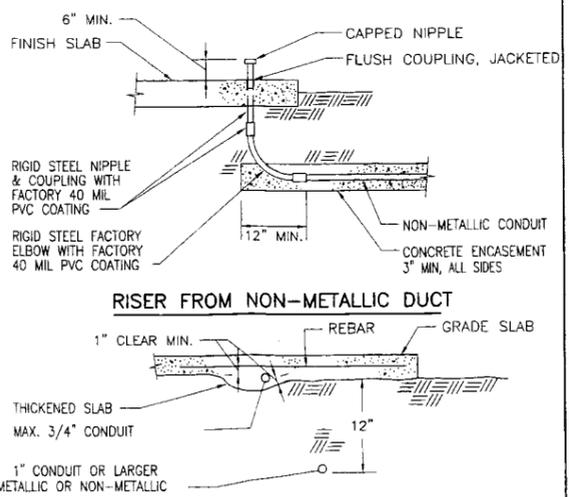


- NOTES:**
- BOLTS SHALL BE INSERTED IN BOLT HOLES BEFORE CONNECTOR IS EMBEDDED.

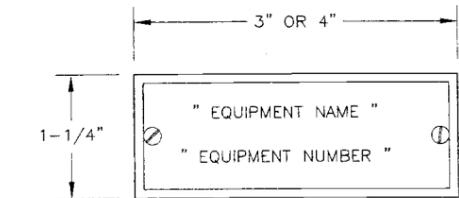
6 GROUNDING INSERT
0600X-DD-E0229 NTS



7 CABLE TO ROD CONNECTION
0600X-DD-E0229 NTS



8 CONDUIT PLACEMENT
0600X-DD-E0219 NTS



- NOTES:**
- ALL LETTERS TO BE 1/4" UNLESS NOTED OTHERWISE.
 - ALL NAMEPLATES TO BE MOUNTED ON THE VERTICAL CENTERLINE OF THE CUBICAL OR DEVICE.
 - ATTACH ALL NAMEPLATES WITH STAINLESS STEEL SCREWS.
 - PROVIDE BLANK NAMEPLATES FOR ALL SPARE AND FUTURE DEVICES.

9 NAMEPLATE
0600X-DD-E0225 NTS

NOTES

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
1	Check	11-23-2009	
2	Check		
3	Check		
4	Check		
5	Check		

W.A. Balogh
11-23-2009
DOCUMENT ID NUMBER: 506X524H00CN03-05-019 003

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DOCUMENT CONTROL 11/24/09

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DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

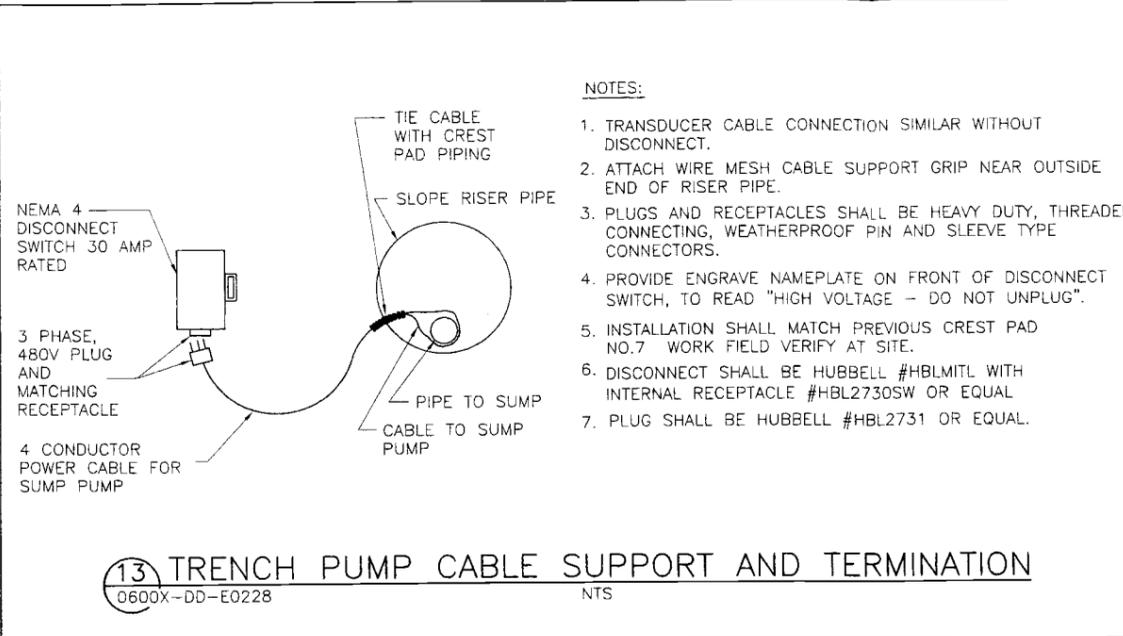
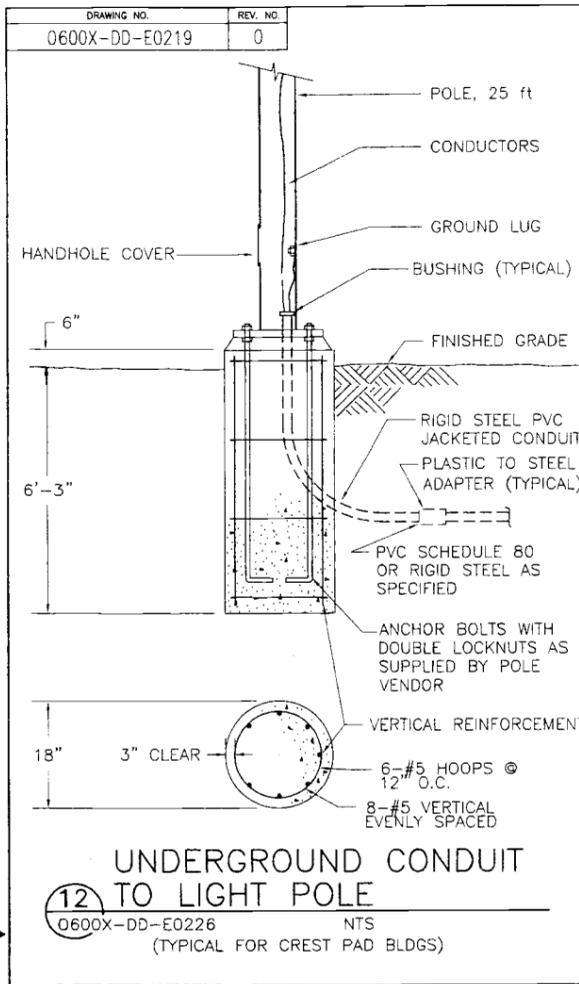
WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

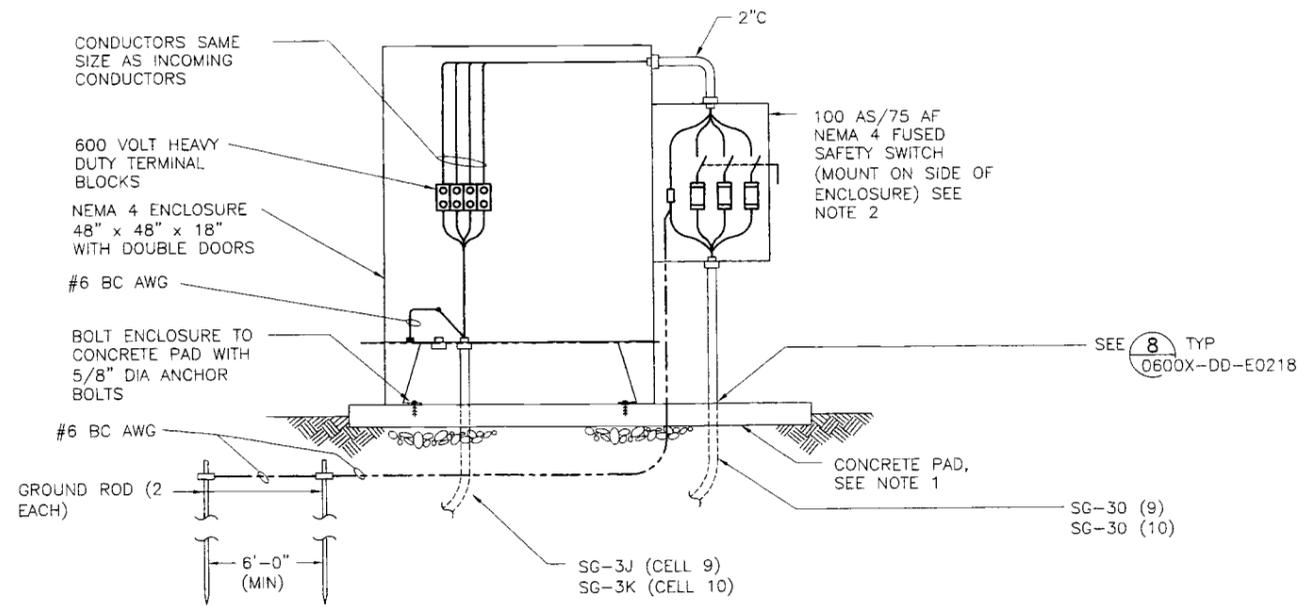
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
ELECTRICAL DETAILS - 1

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
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TASK	DRAWING NO.	REV. NO.
EDRF	0600X-DD-E0218	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16459 SHT01	600G	7301



- NOTES:
1. TRANSDUCER CABLE CONNECTION SIMILAR WITHOUT DISCONNECT.
 2. ATTACH WIRE MESH CABLE SUPPORT GRIP NEAR OUTSIDE END OF RISER PIPE.
 3. PLUGS AND RECEPTACLES SHALL BE HEAVY DUTY, THREADED CONNECTING, WEATHERPROOF PIN AND SLEEVE TYPE CONNECTORS.
 4. PROVIDE ENGRAVE NAMEPLATE ON FRONT OF DISCONNECT SWITCH, TO READ "HIGH VOLTAGE - DO NOT UNPLUG".
 5. INSTALLATION SHALL MATCH PREVIOUS CREST PAD NO.7 WORK FIELD VERIFY AT SITE.
 6. DISCONNECT SHALL BE HUBBELL #HBLMITL WITH INTERNAL RECEPTACLE #HBL2730SW OR EQUAL.
 7. PLUG SHALL BE HUBBELL #HBL2731 OR EQUAL.



NOTES

1. FOR LOOP FEED ENCLOSURE CONCRETE PAD DETAILS, SEE STRUCTURAL DETAIL 4 0600X-DD-C0476
2. PROVIDE AND INSTALL ENGRAVED NAMEPLATE TO READ: "DISCONNECT FOR MCC-T9"; ADJUST ACCORDINGLY FOR CELL 10. MOUNT TO FRONT FACE OF DISCONNECT.

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WASHINGTON CLOSURE HANFORD LLC
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP

11-23-2009
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RAYMOND E. MERRILL
REGISTERED PROFESSIONAL ENGINEER
12322
11/09

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WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON					WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO				
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY CELLS 9 - 10 ELECTRICAL DETAILS - 2									
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RECORD INFORMATION

RECORD NO. H-6-16460 SHT01	BLDG NO. 600G	INDEX NO. 7301
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334 WCH-000006 09/05

RACEWAY AND CABLE SCHEDULE CELL 9

CONDUIT NO.	CONDUCTORS	CONDUIT		FUNCTION	FROM	TO	ROUTE	REMARKS
		NO.	SIZE					
C150(9)	EMPTY (SPARE)	1	2"	480V POWER	CELL NO.9 - MCC-T9	PB-PTN11	UNDERGROUND	WITH PULLCORD
C151(9)	EMPTY (SPARE)	1	2"	480V POWER	PB-PTN11	MH-32	UNDERGROUND	WITH PULLCORD
C152(9)	4#12, 1#12 GRD (2 SPARE)	1	2"	120V CONTROL	CREST PAD BLDG NO. 9 CONTROL PNL	MH-32	UNDERGROUND	MANHOLE MH-32 (FLOOD SWITCH CELL 9 ONLY)
C156(9)	12 # 16 CABLE	1	2"	120V CONTROL	CREST PAD BLDG NO.9 CONTROL PNL	PB-PTN11	UNDERGROUND	CONTINUE CKT C170
C157(9)	EMPTY (SPARE)	1	2"	POWER	CREST PAD BLDG NO.9	PB-PTN11	UNDERGROUND	WITH PULLCORD
C158(9)	EMPTY (SPARE)	1	2"	SIGNAL	CREST PAD BLDG NO.9	MH-32	UNDERGROUND	WITH PULLCORD
C159(9)	EMPTY (SPARE)	1	2"	SIGNAL	CREST PAD BLDG NO.9	MH-32	UNDERGROUND	WITH PULLCORD
C170	12 #16 CABLE	1	2"	120V CONTROL	PB-PTN11	PB-LTP1-LTP6 (MH-34-39)	UNDERGROUND	MH-34-39 FLOOD SWITCH (NOTE 2), SEE C156(9)
C171	EMPTY (SPARE)	1	2"	120V CONTROL	CREST PAD BLDG NO.9 CONTROL PNL	PB-LTP1-LTP6-MH-39	UNDERGROUND	SPARE WITH PULLCORD
SG-3J	3#1, 1#8GRD	1	EXISTING 3"	480V POWER	MDP-2	PB-PTN9	UNDERGROUND	VIA: PB-PTNX, PB-PTN8
SG-3J	3#1, 1#8GRD	1	3"	480V POWER	PB-PTN9	LOOP FEED ENCL. CELL 9	UNDERGROUND	VIA: PB-PTN10
SG-3K	3#1/0, 1#6GRD	1	EXISTING 3"	480V POWER	MDP-2	PB-PTN9	UNDERGROUND	VIA: PB-PTNX, PB-PTN8
SG-3K	3#1/0, 1#6GRD	1	3"	480V POWER	PB-PTN9	PB-PTN11	UNDERGROUND	VIA: PB-PTN10
SG-3L	EMPTY (SPARE)	1	3"	480V POWER	PB-PTN9	PB-PTN11	UNDERGROUND	VIA: PB-PTN10 WITH PULLCORD
SG-3M	EMPTY (SPARE)	1	3"	SPARE	PB-PTN9	PB-PTN11	UNDERGROUND	VIA: PB-PTN10 WITH PULLCORD
SG-3N	EMPTY (SPARE)	1	3"	SPARE	PB-PTN9	PB-PTN11	UNDERGROUND	VIA: PB-PTN10 WITH PULLCORD
SG-3O(9)	3#1, 1#8GRD	1	3"	480V POWER	LOOP FEED ENCLOSURE CELL NO. 9	MCC-T9	UNDERGROUND	

RACEWAY AND CABLE SCHEDULE CELL 10

CONDUIT NO.	CONDUCTORS	CONDUIT		FUNCTION	FROM	TO	ROUTE	REMARKS
		NO.	SIZE					
C150(10)	EMPTY (SPARE)	1	2"	480V POWER	CELL NO.10 - MCC-T10	PB-PTN13	UNDERGROUND	
C151(10)	EMPTY (SPARE)	1	2"	480V POWER	PB-PTN13	MH-33	UNDERGROUND	
C152(10)	4#12, 1#12 GRD (2 SPARE)	1	2"	120V CONTROL	CREST PAD BLDG NO.10 CONTROL PNL	MH-33	UNDERGROUND	MANHOLE MH-33 (FLOOD SWITCH CELL 10 ONLY)
C156(10)	EMPTY (SPARE)	1	2"	POWER	CREST PAD BLDG NO.10	PB-PTN13	UNDERGROUND	WITH PULLCORD
C157(10)	EMPTY (SPARE)	1	2"	POWER	CREST PAD BLDG NO.10	PB-PTN13	UNDERGROUND	WITH PULLCORD
C158(10)	EMPTY (SPARE)	1	2"	SIGNAL	CREST PAD BLDG NO.10	MH-33	UNDERGROUND	WITH PULLCORD
C159(10)	EMPTY (SPARE)	1	2"	SIGNAL	CREST PAD BLDG NO.10	MH-33	UNDERGROUND	WITH PULLCORD
SG-3K	3#1/0, 1#6GRD	1	3"	480V POWER	PB-PTN11	LOOP FEED ENCL. CELL 10	UNDERGROUND	VIA: PB-PTN12
SG-3L	EMPTY (SPARE)	1	3"	480V POWER	PB-PTN11	PB-PTN13	UNDERGROUND	VIA: PB-PTN12 WITH PULLCORD
SG-3M	EMPTY (SPARE)	1	3"	SPARE	PB-PTN11	PB-PTN13	UNDERGROUND	VIA: PB-PTN12 WITH PULLCORD
SG-3N	EMPTY (SPARE)	1	3"	SPARE	PB-PTN11	PB-PTN13	UNDERGROUND	VIA: PB-PTN12 WITH PULLCORD
SG-3O(10)	3#1/0, 1#6GRD	1	3"	480V POWER	LOOP FEED ENCLOSURE CELL NO. 10	MCC-T10	UNDERGROUND	

DUCT BANK SCHEDULE (NORTH)

CELL	SECTION	NEW POWER CONDUIT NUMBERS	NEW CONTROL CONDUIT NUMBERS
9	TN9 (FROM E0221) NOTE 1	SG-3J, SG-3K, SG-3L SG-3M, SG-3N	C170, C171
10	TN10 (FROM E0222) NOTE 1	SG-3K, SG-3L, SG-3M, SG-3N	

- DUCT BANK CONDUITS TO BE CONCRETE ENCASED SEE 0600X-DD-E0218
- CONDUIT BETWEEN PULL BOXES WITH NEMA 3R JUNCTION BOX, PROVIDE 3/4" CONDUIT TAP TO EACH MANHOLE FOR FLOOD SWITCH.

WASHINGTON CLOSURE HANFORD JOB NO. 14655
 COMPLIANCE/CONTRACTOR DOCUMENT STATUS STAMP
 Work may proceed.
 Items and details. Work may proceed pending resolution.
 Review and resolve. Work may proceed upon resolution of indicated conditions.
 Review and resolve. Work may not proceed.
 Permit/allow to proceed as required.
 Permit/allow to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contractual obligations or release any "hold" placed on the contract.
 W.A. [Signature] 11-23-2009
 SOLOVSKY RICHMOND 05-04-005

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ISSUED FOR AWARD	NOV 13 2009								
REV.	DATE	DESCRIPTION	DRAWN BY	CHK	ORD/ENGR	ENGR/CHK	SYS ENGR	PROJ ENGR	

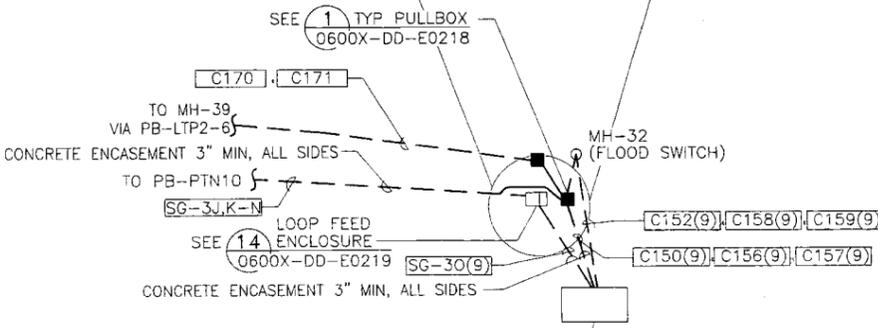
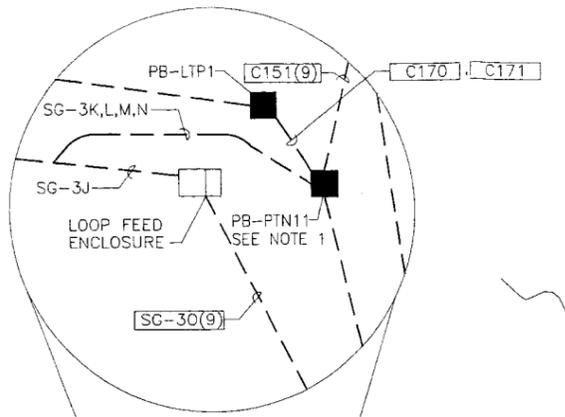
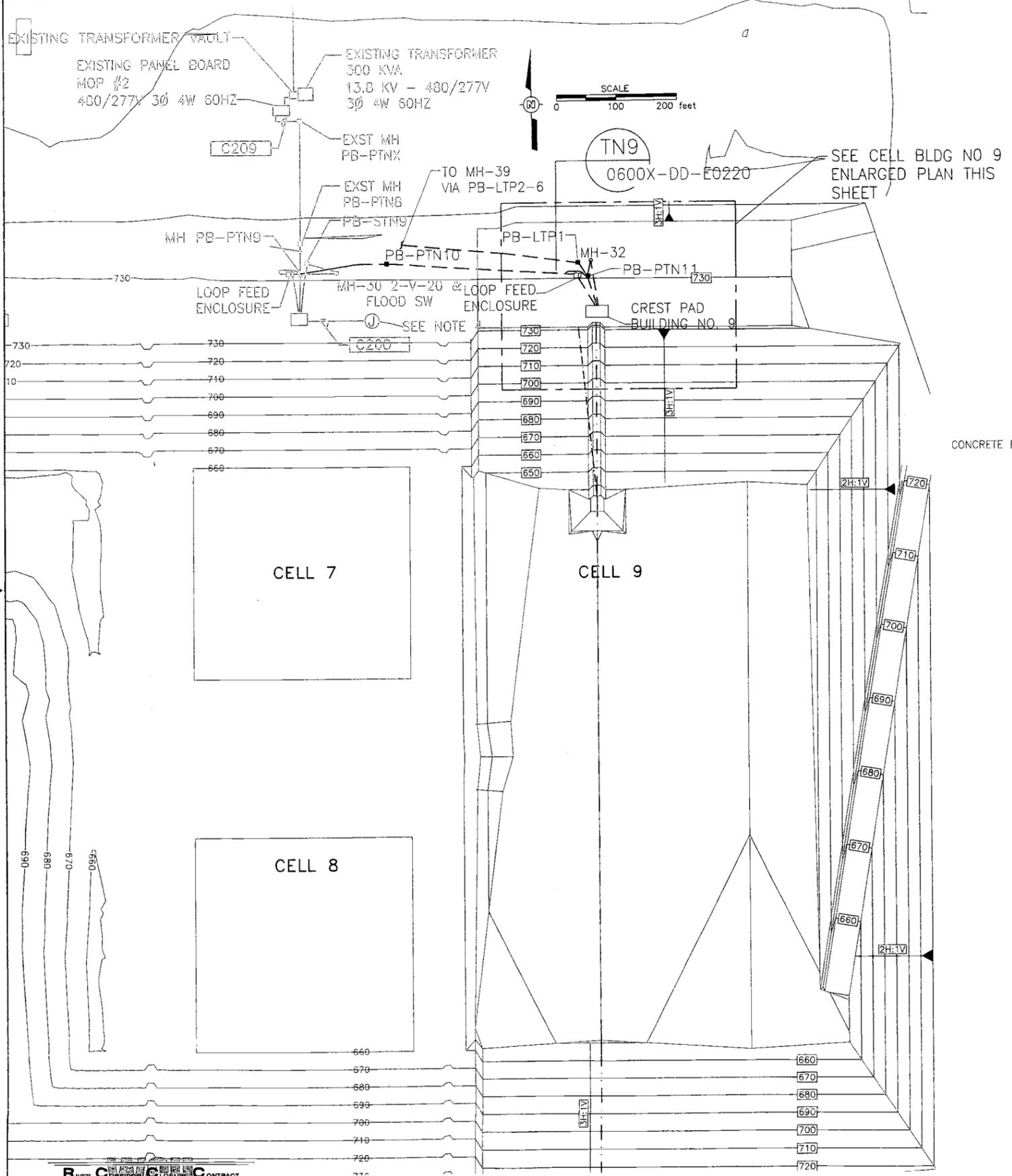
U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
 WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
 CELLS 9 - 10
 ELECTRICAL CABLE AND RACEWAY SCHEDULE

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0220.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-E0220	0

DRAWING NO. 0600X-DD-E0221
REV. NO. 0



CELL BLDG NO 9 ENLARGED PLAN
NTS

LEGEND	
	EXISTING
	NEW

NOTES

- ALL PULL BOXES SHALL BE 30" W x 48" L x 40" D (INSIDE DIMENSIONS) UNLESS OTHERWISE NOTED
- ALL DUCT BANK CONDUITS TO BE CONCRETE ENCASED UNLESS SPECIFIED OTHERWISE. SEE DETAIL
- SEE DWG 0600X-DD-E0220 FOR CONDUIT/CONDUCTORS SIZES.
- COORDINATE NEW DUCT BANKS W/NEW YARD PIPING. DUCT ROUTING SHALL MATCH PREVIOUS CELL NO. 7 ROUTING.
- MANHOLES MH-34 THROUGH MH-39 SHALL HAVE FLOOD SWITCHES. CONDUIT FOR FLOOD SWITCH POWER AND SIGNAL SHALL BE SUPPLIED FROM CELL 9 CREST PAD BUILDING. PULLBOXES SHALL BE INSTALLED EVERY 250 FEET. SEE DWG. 0600X-DD-C0465
- USE CRESTPAD 9 TO RECEIVE SIGNAL FROM FLOOD SWITCHES IN MANHOLES. MH-32, 34-39; MH-33 WILL USE CREST PAD 10. SIGNALS WILL THEN BE SENT TO BASE WIRELESS.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT SEALS STAMP			
1	Work prepared		
2	Review and issued. Work may proceed per to revision.		
3	Review and issued. Work may proceed per to revision subject to inclusion of indicated comments.		
4	Review and issued. Work may not proceed.		
5	Permitted to proceed no further.		

Permitted to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contractual obligations or release any "hold" placed on the contract.

DATE	11-23-2009
BY	W.A. [Signature]
PROJECT NO.	SCX52400XN03-05-014-006

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REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ENGR	ENGR	ENGR	ENGR	PROJ ENGR
0	11/2/09	ISSUED FOR AWARD	MJ	R	R	R	N/A		

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON	WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO
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ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
ELECTRICAL SITE PLAN - CELL 9

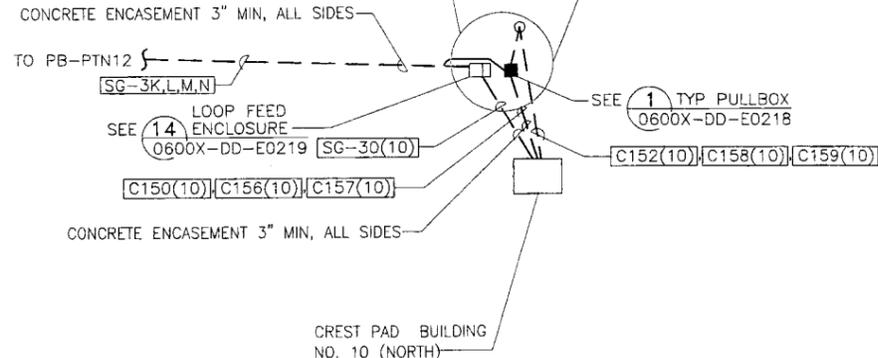
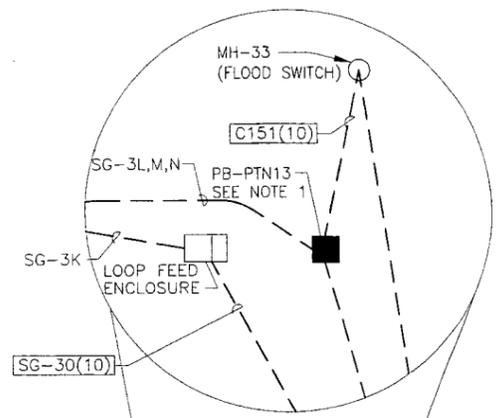
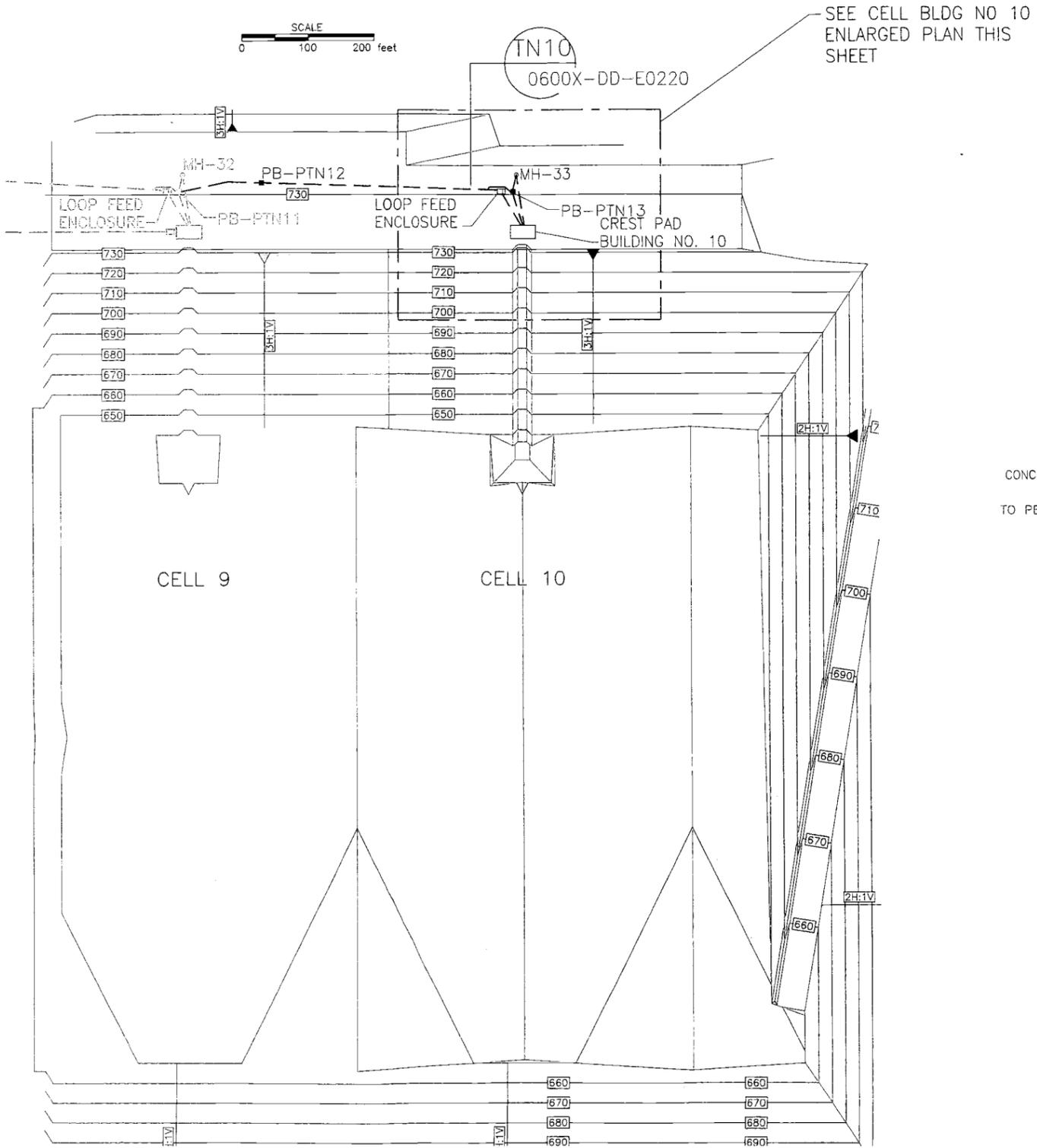
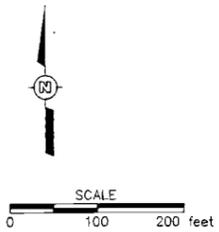
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RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16462 SH01	600G	7301

TASK	DRAWING NO.	REV. NO.
EDRF	0600X-DD-E0221	0

RIVER CORRIDOR CLOSURE CONTRACT
Dedicated To Safety Excellence

5/10/09



CELL BLDG NO 10 ENLARGED PLAN
NTS

LEGEND	
	EXISTING
	NEW

NOTES

- ALL PULL BOXES SHALL BE 30" W x 48" L x 40" D (INSIDE DIMENSIONS) UNLESS OTHERWISE NOTED.
- ALL DUCT BANK CONDUITS TO BE CONCRETE ENCASED UNLESS SPECIFIED OTHERWISE. SEE DETAIL.
4
0600X-DD-E0218
- SEE DWG 0600X-DD-E0220 FOR CONDUIT/CONDUCTORS SIZES.
- COORDINATE NEW DUCT BANKS W/NEW YARD PIPING. DUCT ROUTING SHALL MATCH PREVIOUS CELL NO. 7 ROUTING.
- USE CRESTPAD 10 TO RECEIVE SIGNAL FROM FLOOD SWITCH IN MANHOLE 33. SIGNAL WILL THEN BE SENT TO BASE WIRELESS.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
1	Work may proceed	2	Review and re-submit. Work may proceed prior to resubmission subject to resolution of indicated comments
3	Review and re-submit. Work may proceed prior to resubmission subject to resolution of indicated comments	4	Review and re-submit. Work may not proceed
5	Re-submission to proceed not required	6	Re-submission to proceed not required
Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contract documents or release any "holds" placed on the contract.			
APPROVED	DATE	APPROVED	DATE
W.A. [Signature]		11-23-2009	
DOCUMENT ID NUMBER		SUBMITAL	
SOW6524PROC03-05-014-007			
DATE	ISSUED FOR	DATE	ISSUED FOR
11/23/09	AWARD		

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DOCUMENT CONTROL *De 11/30/09*

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	DRG/ENGR	ENG'R CHK	SYS ENGR	PROJ ENGR
	11/23/09	ISSUED FOR AWARD						

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

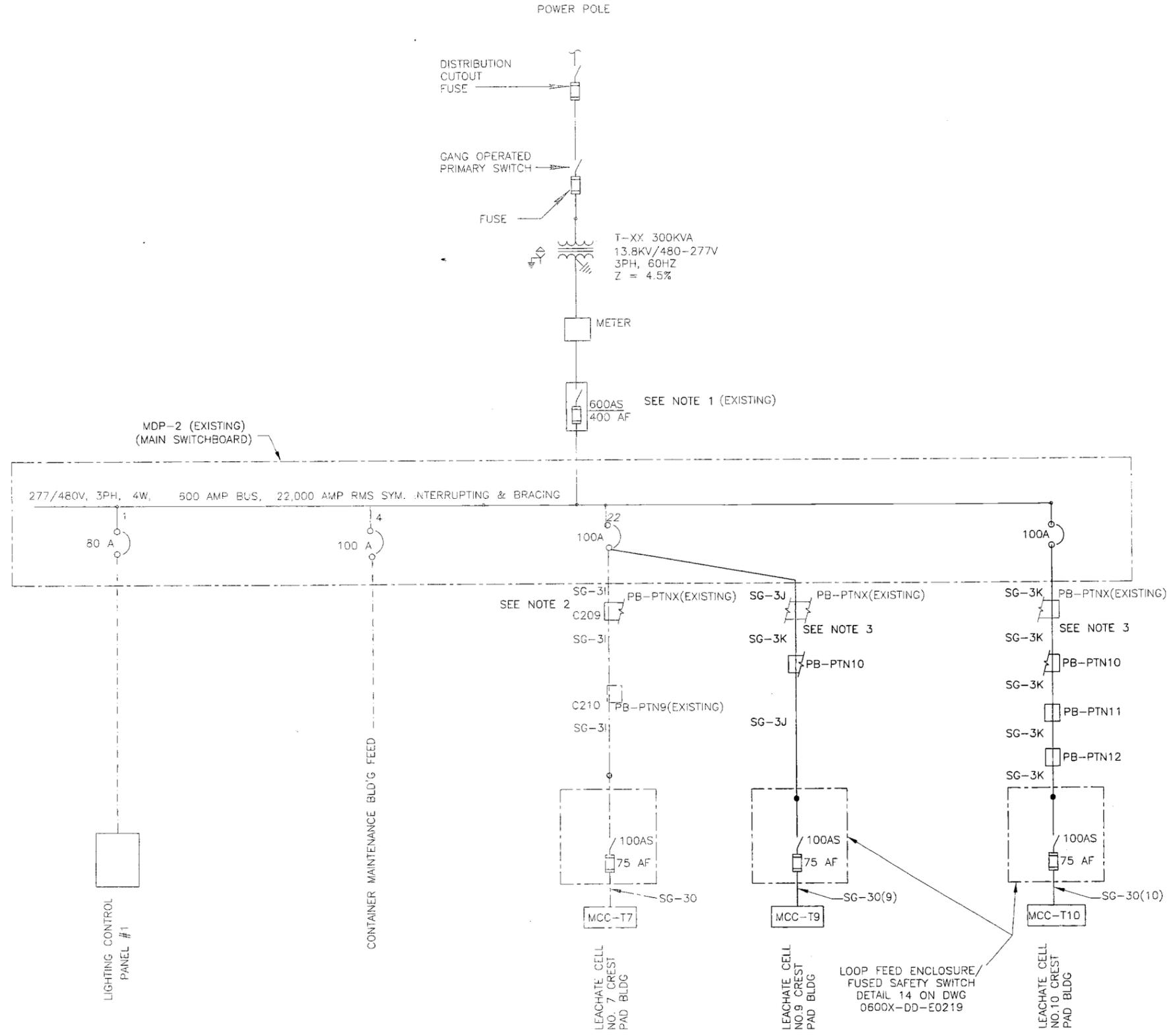
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
ELECTRICAL SITE PLAN - CELL 10

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE022.DWG

TASK	DRAWING NO.	REV. NO.
EDRF	0600X-DD-E0222	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16463 SHT01	600G	7301





- NOTES
- SEE DWG. 0600X-DD-E0113 FOR UTILITY TO PANEL MDP.
 - SEE DWG 0600X-DD-E0220 FOR FACILITY RACEWAY AND CABLE SCHEDULE.
 - PB-PTN8 AND PB-PTN9 NOT SHOWN FOR CLARITY.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
1	Check for errors		
2	Check for omissions		
3	Check for compliance		
4	Check for consistency		
5	Check for completeness		
6	Check for accuracy		
7	Check for clarity		
8	Check for legibility		
9	Check for uniformity		
10	Check for standardization		

W.A. [Signature] 11-23-2009
SOW524000003-05-014-008

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LEGEND

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REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ENGR	ENGR/CHK	SYS ENGR	PROJ ENGR
1	11/23/09	ISSUED FOR AWARD	N	R	R	N/A	PS	

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
ELECTRICAL ONE-LINE SWITCHGEAR

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDE0111.DWG
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TASK EDRF	DRAWING NO. 0600X-DD-E0223	REV. NO. 0
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RECORD INFORMATION

RECORD NO. H-6-16464 SHT01	BLDG NO. 600G	INDEX NO. 7201
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1. 1" C 3#12, 1#12G
2. 3/4"C, 3#10, 1#10G
3. 1" C, 4#6, 1#8G
4. 1" C, 3#10, 1#10G
5. SEE DWG 0600X-DD-E0220 FOR RACEWAY AND CABLE SIZE.
6. 42,000 AMP MINIMUM RMS SHORT CIRCUIT RATING. BREAKERS TO HAVE 25,000 AMP MINIMUM INTERRUPTING CAPACITY.
7. SEE DRAWING 0600X-DD-E0229 FOR CONDUIT AND CONDUCTORS TO LIGHT POLE.
8. 4 # 12AWG. VENDOR SUPPLIED
9. 4 # 10AWG. VENDOR SUPPLIED

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
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5	6	7	8
9	10	11	12
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17	18	19	20
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97	98	99	100

W.A. [Signature] 11-23-2009
 DOCUMENT NUMBER: 0600X-DD-E0224-009
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DOCUMENT CONTROL 0600X-DD-E0224-009

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△	11/3/09	ISSUED FOR AWARD							
REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENGR/ CHK	SYS ENGR	PROJ ENGR	

U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

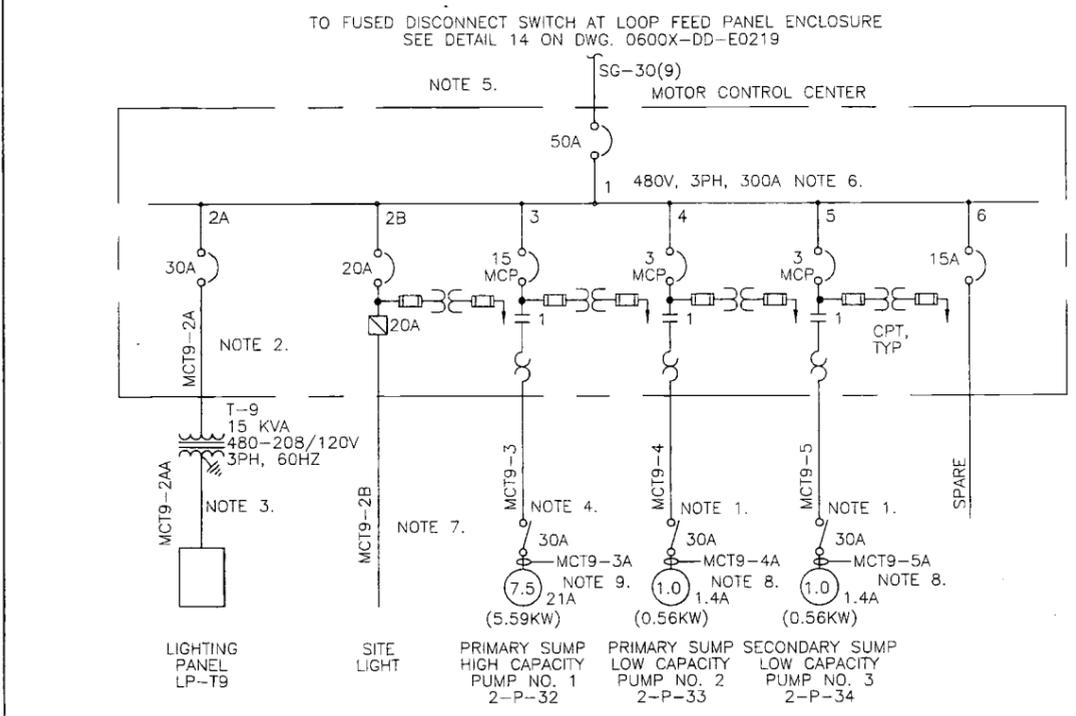
WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
 WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
 CELLS 9 - 10
 MCC ONE-LINE DIAGRAMS

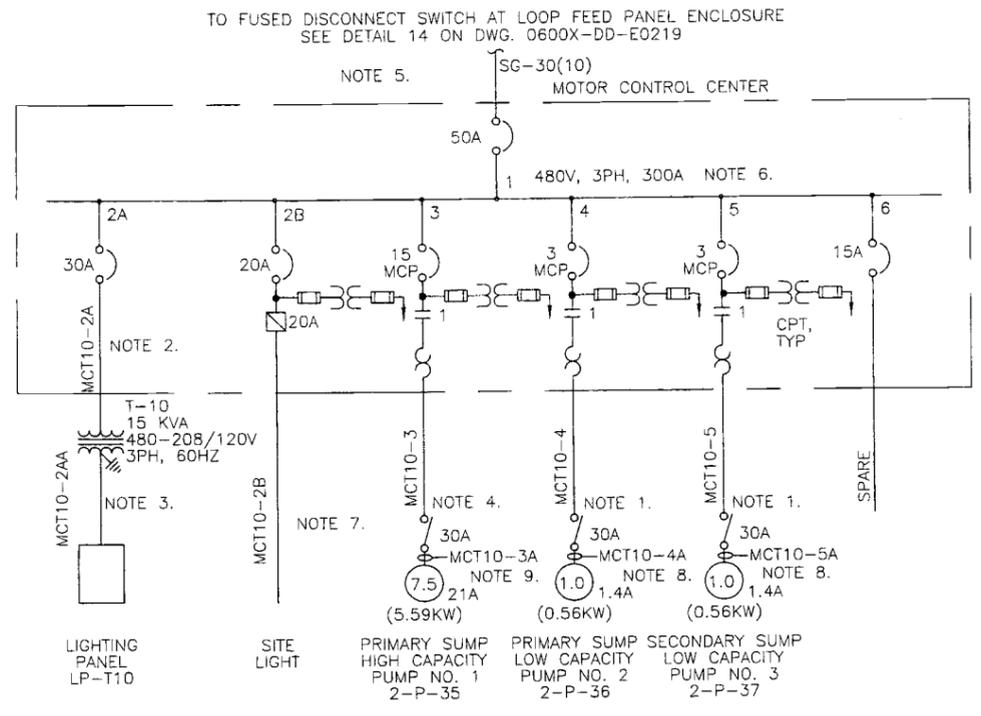
WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0224.DWG

TASK	DRAWING NO.	REV. NO.
EDRF	0600X-DD-E0224	0

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16465 SHT01	600G	7201

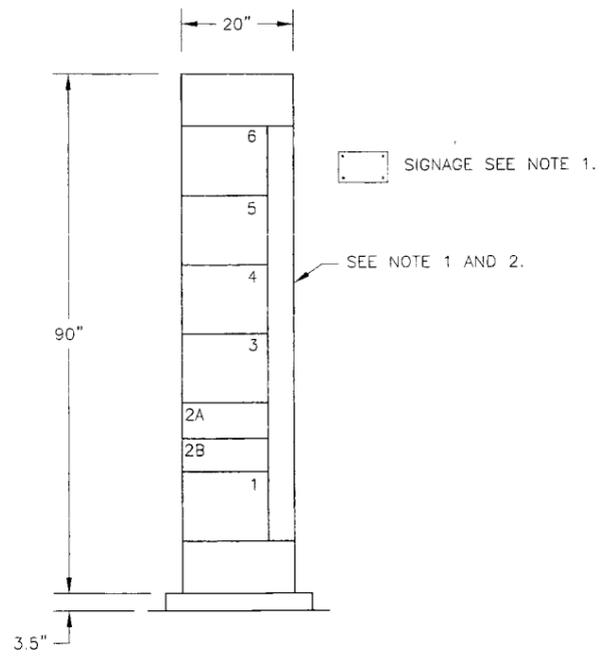


TRENCH CELL 9 ONE LINE DIAGRAM
 MOTOR CONTROL CENTER MCC-T9
 (SEE ELEVATION ON DWG 0600X-DD-E0225)

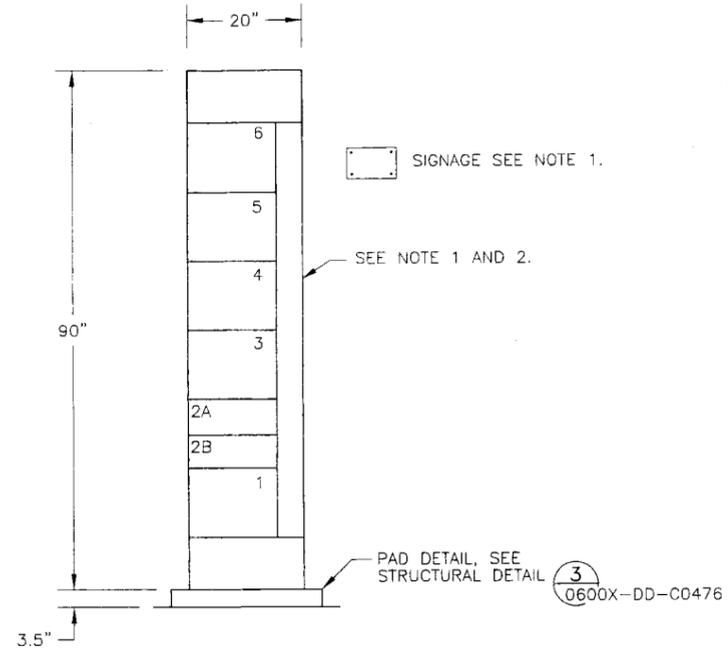


TRENCH CELL 10 ONE LINE DIAGRAM
 MOTOR CONTROL CENTER MCC-T10
 (SEE ELEVATION ON DWG 0600X-DD-E0225)

- FOR TYPICAL NAMEPLATE DETAIL SEE 9 0600X-DD-E0218
- CONTRACTOR SHALL PROVIDE ARRANGEMENT OF CUBICLES IN NEW MCC IDENTICAL TO EXISTING MCC INSTALLED AT PREVIOUS CELL 7. FIELD VERIFY AT SITE. MCC MANUFACTURER SHALL MATCH CELL 7.
- PROVIDE AND INSTALL SIGNAGE TO MATCH EXISTING CELL 7. FIELD VERIFY AT SITE. SIGNAGE TO READ: "SERVICE DISCONNECT FOR THIS BUILDING LOCATED 100 FT NORTH AND IS LABELED DISCONNECT FOR MCC-T9 (OR MCC-T10)", ACCORDINGLY.
- VALUE IN () INDICATES VALUE ASSOCIATED WITH CELL 9 OR 10.



FRONT ELEVATION
MOTOR CONTROL CENTER MCC-T9
 (TRENCH CELL 9 CREST PAD BUILDING)



FRONT ELEVATION
MOTOR CONTROL CENTER MCC-T10
 (TRENCH CELL 10 CREST PAD BUILDING)

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
1	As built		
2	Review and submit. Work may proceed per to submission		
3	Review and submit. Work may proceed per to submission subject to resolution of all issues		
4	Review and submit. Work may proceed per to submission		
5	Permission to proceed not required		

W.A. Balogh 11-23-2009
 0600X-DD-E0225-05-014-010

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DOCUMENT CONTROL 11/23/09

REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
1	11/13/09	ISSUED FOR AWARD	M	R	Z	R	N/A	SB

U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
 RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
 DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
 CELLS 9 - 10
 MCC DETAILS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0225.DWG

RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16466 SHT01	600G	7301

TASK	DRAWING NO.	REV. NO.
EDRF	0600X-DD-E0225	0



208-120 VOLTS 3 Ø 4 W 50 AMP MAIN BREAKER		PANELBOARD LP-19 LOCATION LEACHATE CELL 9 CREST PAD BUILDING										FEED TOP MTG SURFACE					
LOAD DESCRIPTION	VOLT AMPERE			LTG	REC	MIS	CIR	BKR	CIR	MIS	REC	LTG	VOLT AMPERE			LOAD DESCRIPTION	
	Ø A	Ø B	Ø C										Ø A	Ø B	Ø C		
METER ROOM LIGHTS	630			9			1	20	20	2	1		400			TRENCH PUMP CONTROL PANEL	
EF-1 ELECT. ROOM		860					1	3	20							SPARE	
SPARE								5	20						1100	UH-2 HEATER METER ROOM	
RECPT'S METER ROOM	540				3		7	20					1100				
UH-1 HEATER ELECT. ROOM		1100					9	20				3P	10		1100		
			1100				1	11							860	EF-2 METER ROOM	
	1100						13	3P								SPARE	
RECPT'S ELECT. ROOM		360			2		15	20						8	490	ELECT. RM & OUTSIDE LIGHTS	
SPARE							17	20								750	TELEMETRY PANEL
SPARE							19	20									SPACE
	2270	2320	1100				TOTAL						TOTAL		1500	1590	2710
	PHASE TOTAL			TOTAL LOAD													
	3770	3910	3810	(31.9AMP)													

208-120 VOLTS 3 Ø 4 W 50 AMP MAIN BREAKER		PANELBOARD LP-110 LOCATION LEACHATE CELL 9 CREST PAD BUILDING										FEED TOP MTG SURFACE					
LOAD DESCRIPTION	VOLT AMPERE			LTG	REC	MIS	CIR	BKR	CIR	MIS	REC	LTG	VOLT AMPERE			LOAD DESCRIPTION	
	Ø A	Ø B	Ø C										Ø A	Ø B	Ø C		
METER ROOM LIGHTS	630			9			1	20	20	2	1		400			TRENCH PUMP CONTROL PANEL	
EF-1 ELECT. ROOM		860					1	3	20							SPARE	
SPARE								5	20						1100	UH-2 HEATER METER ROOM	
RECPT'S METER ROOM	540				3		7	20					1100				
UH-1 HEATER ELECT. ROOM		1100					9	20				3P	10		1100		
			1100				1	11							860	EF-2 METER ROOM	
	1100						13	3P								SPARE	
RECPT'S ELECT. ROOM		360			2		15	20						8	490	ELECT. RM & OUTSIDE LIGHTS	
SPARE							17	20								750	TELEMETRY PANEL
SPARE							19	20									SPACE
	2270	2320	1100				TOTAL						TOTAL		1500	1590	2710
	PHASE TOTAL			TOTAL LOAD													
	3770	3910	3810	(31.9AMP)													

LUMINAIRE SCHEDULE			
TYPE	WATTS LAMP	VOLTS	DESCRIPTION
F5	2-34 W R.S FLUOR	120	INDUSTRIAL TYPE FLUORESCENT LUMINAIRE, 1'x4', 2 LAMP, HEAVY GAGE STEEL REFLECTOR, WHITE POLYESTER POWDER ENAMEL FINISH, ELECTRONIC BALLAST LITHONIA EJA 240 SERIES OR EQUAL
H2	50 W HPS	120	WALL MOUNT ON RECESSED ON OUTLET BOX, HIGH PRESSURE SODIUM, 10" ROUND OPEN BAFFLE, WEATHERPROOF GASKETING, BRONZE FINISH HUBBELL BHI SERIES OR EQUAL
H4	250 W HPS	480	POLE MOUNTED, HIGH PRESSURE SODIUM, LIGHTWEIGHT ALUMINUM, RECTILINEAR SHAPE, CONTINUOUS GASKET, TEMPERED GLASS LENS FLUSH WITH BOTTOM OF LUMINAIRE, U.L. LISTED FOR WET LOCATIONS. (LITHONIA CAT # KSF2-250SR3-480-RP12-DDB CROWFORDSVILLE, IN) OR EQUAL 25' ROUND TAPERED ALUMINUM POLE (#TRA-25-7E-DM19-DDB) OR EQUAL SUITABLE FOR 100 MPH WINDS AND MATCHED TO LUMINAIRE, SEE 12

0600X-DD-E0219

NOTES

- CIRCUIT BREAKERS IN PANELS LP-T9 AND LP-T10 SHALL BE 10,000 AMP MINIMUM INTERRUPTING RATING.

WASHINGTON CLOSURE HANFORD 208 NO. 11855
 SUPPLEMENTAL CONTRACTOR DOCUMENT STATUS STAMP

1 Work may proceed.
 2 Review and resubmit. Work may proceed prior to resubmission subject to verification of indicated comments.
 3 Review and resubmit. Work may proceed prior to resubmission subject to verification of indicated comments.
 4 Review and resubmit. Work may proceed.
 5 Permission is suspended until required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.

DATE	BY	REVISION
11-23-2009	W.A. B...	

DOCUMENT NUMBER: 0600X-DD-E0226-01
 DOCUMENT TITLE: ELECTRICAL SCHEDULES

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DOCUMENT CONTROL *Dec 11/2009*

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△	11/18/09	ISSUED FOR AWARD							
REV.	DATE	DESCRIPTION	DRAWN BY	CHECK	ENG'R	CHK	ENG'R	CHK	PROJ. ENG'R

SCALE: NA

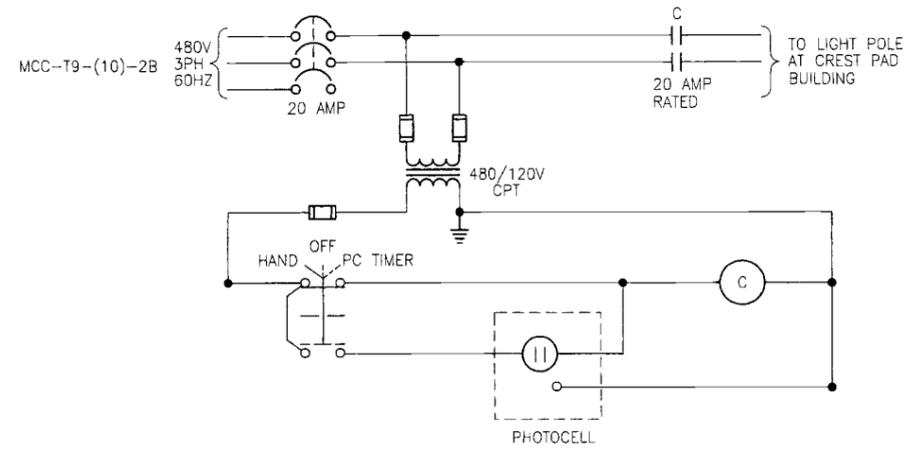
U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
 WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY CELLS 9 - 10 ELECTRICAL SCHEDULES		
WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDE0226.DWG

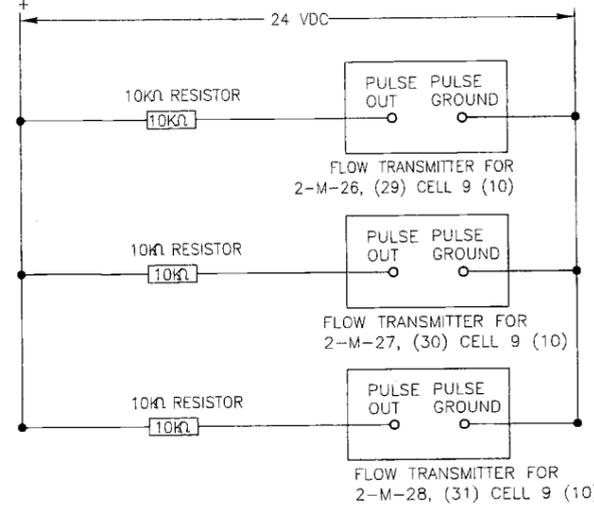
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RECORD INFORMATION		
RECORD NO. H-6-16467 SHT01	BLDG NO. 600G	INDEX NO. 7301



LIGHT POLE AT CREST PAD BUILDING LIGHTING CONTROL DIAGRAM

115VAC FROM:
LP-T9-2 (CELL 9) LP-T10-2 (CELL 10) SEE NOTE 1.
115 VAC / 24 VDC POWER SUPPLY (PS-3)



MOUNT IN TRENCH PUMP CONTROL PANEL *

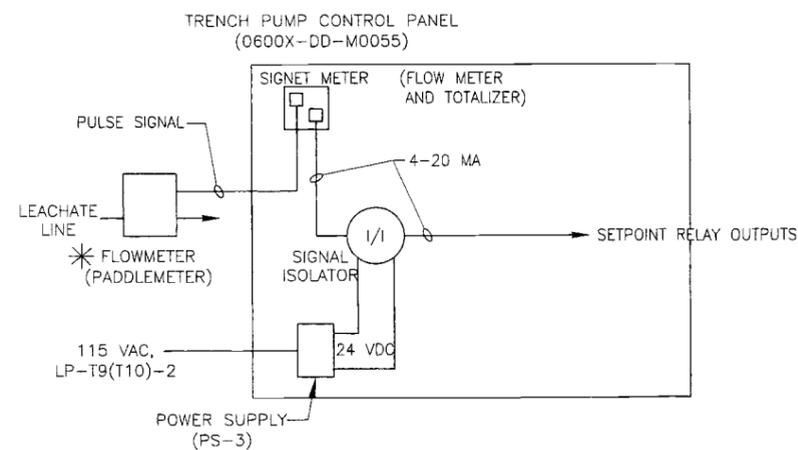
POWER SUPPLY FOR FLOW TRANSMITTERS FOR FLOWMETERS 2-M-26 THRU 2-M-31

* SEE DRAWING 0600X-DD-E0230

1. POWER SUPPLY (PS-3) LOCATED INSIDE TRENCH PUMP CONTROL PANEL.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP			
<input type="checkbox"/>	Work may proceed	<input type="checkbox"/>	Review and resubmit. Work may proceed prior to resubmission subject to resolution of indicated concerns.
<input type="checkbox"/>	Review and resubmit. Work may proceed	<input type="checkbox"/>	Review and resubmit. Work may proceed
<input type="checkbox"/>	Permitted to proceed per request	<input type="checkbox"/>	Permitted to proceed per request
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/contractor and does not release the supplier/contractor from full compliance with contractual obligations or release any "hold" placed on the contract.			
DATE	BY	DATE	BY
11-23-2009	W.A. [Signature]	11-23-2009	[Signature]
SOLICITATION NO. 03-05-014-012		DOCUMENT NO. 14655	

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CREST PAD LEACHATE FLOW MEASUREMENT

TYPICAL FOR FLOWMETER (PADDLEMETER) NO. 2-M-26, 2-M-27, 2-M-28, CELL 9
2-M-29, 2-M-30, 2-M-31, CELL 10

*SEE MECHANICAL SCHEDULE



DOCUMENT CONTROL As 11/24/09

△									
△									
△									
△									
△	11/23/09	ISSUED FOR AWARD							
REV.	DATE	DESCRIPTION	DRAWN BY	DRAWN CHK	ENGR/ENGR	ENGR/ENGR	ENGR/ENGR	ENGR/ENGR	ENGR/ENGR
SCALE:	NA								

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
CONTROL SCHEMATICS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0227.DWG

TASK	DRAWING NO.	REV. NO.
EDRF	0600X-DD-E0227	0

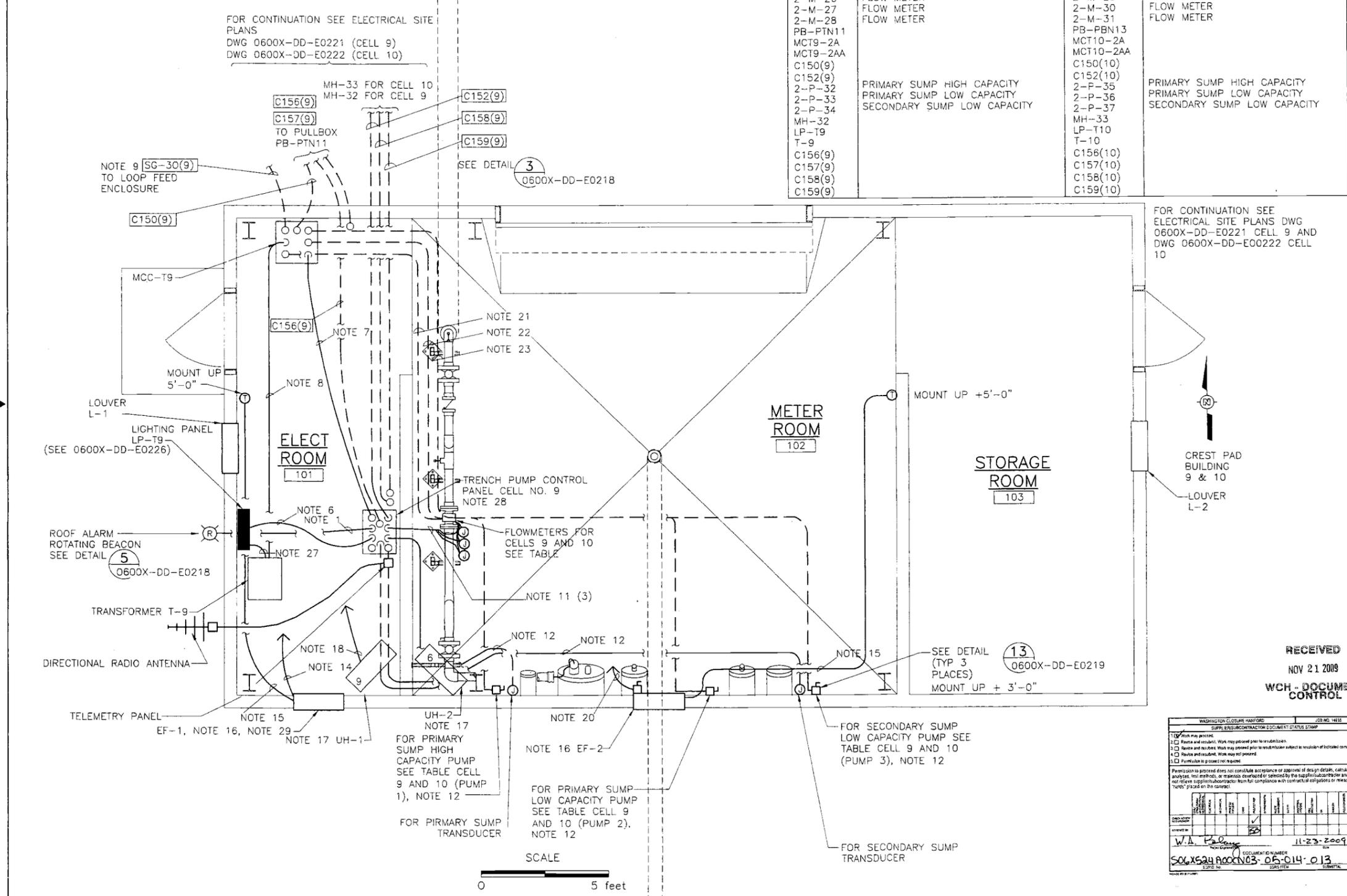
RECORD INFORMATION		
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16468 SHT01	600G	7502

THIS DRAWING SHOWS CONDUIT AND EQUIPMENT FOR LEACHATE COLLECTION AT CELL NO. 9. ARRANGEMENT FOR CELL 10 ARE SIMILAR WITH THE TAG NUMBER CHANGES.

CELL 9	CELL 10
MCT9-3	MCT10-3
MCT9-4	MCT10-4
MCT9-5	MCT10-5
MCC-T9	MCC-T10
SG-30(9)	SG-30(10)
2-M-26	2-M-29
2-M-27	2-M-30
2-M-28	2-M-31
PB-PTN11	PB-PBN13
MCT9-2A	MCT10-2A
MCT9-2AA	MCT10-2AA
C150(9)	C150(10)
C152(9)	C152(10)
2-P-32	2-P-35
2-P-33	2-P-36
2-P-34	2-P-37
MH-32	MH-33
LP-T9	LP-T10
T-9	T-10
C156(9)	C156(10)
C157(9)	C157(10)
C158(9)	C158(10)
C159(9)	C159(10)

NOTES

- 3/4"C, 2#12, 1#12G
- NOT USED
- NOT USED
- NOT USED
- NOT USED
- 1"C, 2#12, 1#12G
- 1"C, 20 #14, 1#14G
- MCT9-2A
- SEE DWG 0600X-DD-E0220 FOR CONDUIT/CONDUCTOR SIZES
- NOT USED
- 3/4"C, 2/C #16 SHLD
- 1"C, VENDOR CABLE
- NOT USED
- 3/4"C, 2#12, 1#12G TO LP-T9-3
- 3/4"C, 2#12, 1#12G
- 1/3HP MINIMUM, 115 VAC, SINGLE-PHASE PROPELLER TYPE EXHAUST FAN
- 3 KW UNIT HEATER
- 3/4"C, 3#12, 1#12G TO LP-T9-9
- 3/4"C, 3#12, 1#12G TO LP-T9-6
- 3/4"C, 3#12, 1#12G TO LP-T9-12
- MCT9-3, SEE ONE LINE DIAGRAM DWG 0600X-DD-E0224
- MCT9-4, SEE ONE LINE DIAGRAM DWG 0600X-DD-E0224
- MCT9-5, SEE ONE LINE DIAGRAM DWG 0600X-DD-E0224
- NOT USED
- FIELD ROUTE ALL CONDUIT ON WALLS.
- NOT USED
- 1"C, 4#6, 1#10G
- SEE CONTROL DIAGRAM ON DWG 0600X-DD-E0231 & 232
- MOUNT DISCONNECT SWITCHES FOR UNIT HEATERS AND EXHAUST FANS ON WALL ADJACENT TO UNITS, NOT SHOWN FOR CLARITY.



FOR CONTINUATION SEE ELECTRICAL SITE PLANS DWG 0600X-DD-E0221 CELL 9 AND DWG 0600X-DD-E0222 CELL 10

FOR CONTINUATION SEE ELECTRICAL SITE PLANS DWG 0600X-DD-E0221 (CELL 9) DWG 0600X-DD-E0222 (CELL 10)

CREST PAD BUILDING 9 & 10
LOUVER L-2

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NOV 21 2009
WCH - DOCUMENT CONTROL

NO.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	CRD/ENGR	ENGR/CHK	SYS ENGR	PRJ ENGR
0	11/13/09	ISSUED FOR AWARD						



SCALE: AS SHOWN

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0228.DWG

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC.
RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC.
DENVER, COLORADO

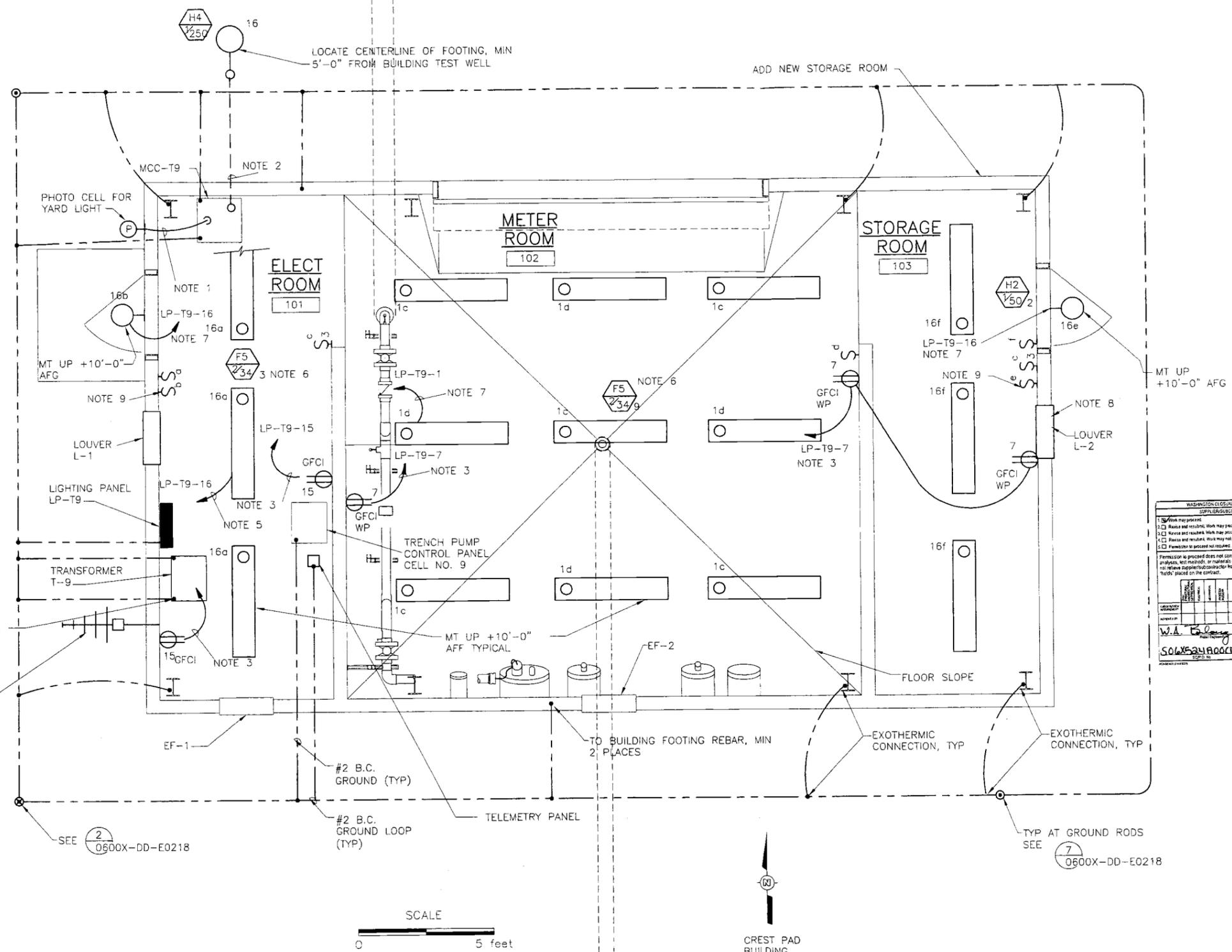
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
CREST PAD ELECTRICAL POWER PLAN

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-E0228	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16469 SHT01	600G	7301





1. 3/4" C, 3#12
2. 1" C, 2#10, 1#10G, MCT9-2B
3. 3/4" C, 2#12, 1#12G
4. NOT USED
5. 3/4" C, 2#12, 1#12G
6. FOR LUMINAIRE SCHEDULE SEE DWG 0600X-DD-E0226
7. 3/4" C, 2#12, 1#12G
8. 24"x24" LOUVER W/SELF-CLOSING DAMPER
9. ENGRAVE SWITCHPLATES S_b AND S_e TO READ: "EXTERIOR DOORLIGHT".
10. CIRCUIT NUMBERS ARE SHOWN ADJACENT TO LIGHTS, RECEPTACLES AND EQUIPMENT. FURNISH, INSTALL AND CONNECT THE QUANTITY OF CONDUCTORS IN CONDUIT AS REQUIRED FOR THE COMBINATION OF LIGHTS, LIGHT SWITCHES, RECEPTACLES AND EQUIPMENT CONNECTIONS ASSIGNED TO THE BRANCH CIRCUIT SHOWN. PROVIDE NO. 12 WIRE WITH NO. 12 GROUND IN 3/4" CONDUIT FOR CIRCUIT LENGTHS LESS THAN 75 FEET. PROVIDE NO. 10 WIRE FOR LENGTHS GREATER THAN 75 FEET.
11. CELLS 9 AND 10 DIRECTIONAL ANTENNAS SHALL COMMUNICATE WITH MASTER TELEMETRY PANEL

THIS DRAWING SHOWS CONDUIT AND EQUIPMENT FOR LEACHATE COLLECTION AT CELL NO. 9. ARRANGEMENT FOR CELL NO. 10 IS SIMILAR WITH THE TAG NUMBER CHANGES.

CELL 9	CELL 10
LP-T9 MCC-T9 MCT9-2B T-9	LP-T10 MCC-T10 MCT10-2B T-10

WASHINGTON CLOSURE HANFORD 200 NO. 14655
 SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP

Work may proceed:
 Release and erection. Work may proceed prior to reinstallation.
 Release and erection. Work may proceed prior to reinstallation subject to completion of related contracts.
 Release and erection. Work may proceed.
 Permission to proceed not required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/subcontractor and does not release supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.

DATE: 11-23-2009
 W.A. Weaver
 SOLVE-5480003-05-014 014

DOCUMENT CONTROL

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WCH - DOCUMENT CONTROL

ISSUED FOR AWARD	N	R	T	R	N/A	B		
REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	DESIGN ENGR	ENG'R CHK	SYS ENGR	PROJ ENGR

U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

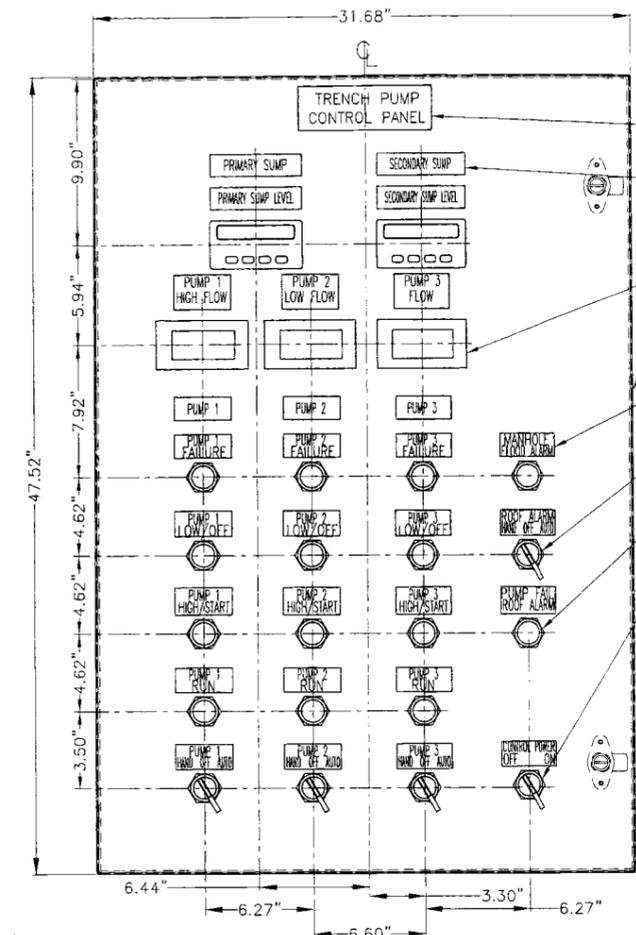
WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON
 WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
 CELLS 9 - 10
 CREST PAD ELECTRICAL LIGHTING PLAN

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0229.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-E0229	0

RECORD INFORMATION

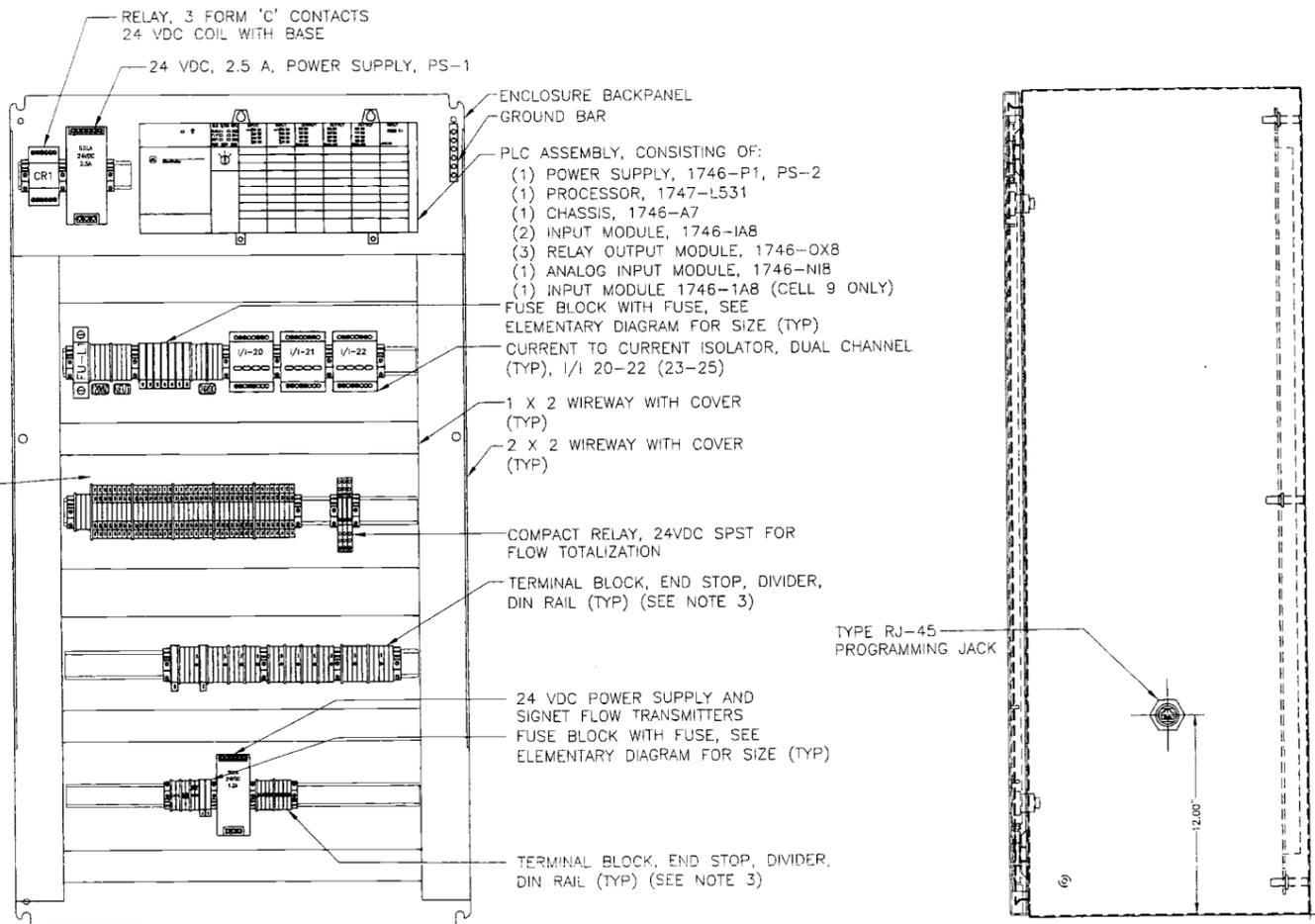
RECORD NO.	BLDG NO.	INDEX NO.
H-6-16470 SHT01	600G	7401



TRENCH PUMP CONTROL PANEL DOOR ARRANGEMENT

SIGNET FLOW TRANSMITTER 2-M-26-28 (29-31) AND POWER SUPPLY-3 SHALL BE INCORPORATED INTO CABINET (SEE 0600X-DD-E0232)

- 2" X 6" ENGRAVED PLATE WITH LETTERING TO FIT, BLACK TEXT ON WHITE BACKGROUND
- 1" X 4" W ENGRAVED PLATE WITH LETTERING TO FIT, BLACK TEXT ON WHITE BACKGROUND
- FLOW INDICATOR
- ENCLOSURE, 36"H X 24"W X 12"D, NEMA 12 WITH HINGED DOOR
- 1" X 2.5" W ENGRAVED PLATE WITH LETTERING TO FIT, BLACK TEXT ON WHITE BACKGROUND
- SELECTOR SWITCH, 3-POS, CONTACT BLOCKS PER ELEMENTARY DIAG (TYP OF 4)
- PILOT LIGHT, 120 VAC, TRANSFORMER, PUSH TO TEST, LENS AS SHOWN (TYP)
- SELECTOR SWITCH, 2-POS, CONTACT BLOCKS PER ELEMENTARY DIAG (TYP OF 1)



TRENCH PUMP CONTROL PANEL BACKPANEL ARRANGEMENT

- RELAY, 3 FORM 'C' CONTACTS 24 VDC COIL WITH BASE
- 24 VDC, 2.5 A, POWER SUPPLY, PS-1
- ENCLOSURE BACKPANEL GROUND BAR
- PLC ASSEMBLY, CONSISTING OF:
 - (1) POWER SUPPLY, 1746-P1, PS-2
 - (1) PROCESSOR, 1747-L531
 - (1) CHASSIS, 1746-A7
 - (2) INPUT MODULE, 1746-IA8
 - (3) RELAY OUTPUT MODULE, 1746-OXB
 - (1) ANALOG INPUT MODULE, 1746-NIB
 - (1) INPUT MODULE 1746-1A8 (CELL 9 ONLY)
- FUSE BLOCK WITH FUSE, SEE ELEMENTARY DIAGRAM FOR SIZE (TYP)
- CURRENT TO CURRENT ISOLATOR, DUAL CHANNEL (TYP), 1/1 20-22 (23-25)
- 1 X 2 WIREWAY WITH COVER (TYP)
- 2 X 2 WIREWAY WITH COVER (TYP)
- COMPACT RELAY, 24VDC SPST FOR FLOW TOTALIZATION
- TERMINAL BLOCK, END STOP, DIVIDER, DIN RAIL (TYP) (SEE NOTE 3)
- 24 VDC POWER SUPPLY AND SIGNET FLOW TRANSMITTERS
- FUSE BLOCK WITH FUSE, SEE ELEMENTARY DIAGRAM FOR SIZE (TYP)
- TERMINAL BLOCK, END STOP, DIVIDER, DIN RAIL (TYP) (SEE NOTE 3)

TYPE RJ-45 PROGRAMMING JACK

NOTES

- SEE 0600X-DD-EE231 FOR ELEMENTARY DIAGRAM
- BACKPANEL EQUIPMENT AND DEVICES ARE SHOWN IN THEIR GENERAL LOCATIONS. LOCATION ADJUSTMENT ARE PERMITTED FOR MOUNTING AND CLEARANCES.
- EACH CABLE ON THE TERMINAL BLOCK SHALL BE IDENTIFIED IN EACH PULLBOX AND TERMINAL AND ON THE AS-BUILT DRAWINGS AS REQUIRED IN THE SPECIFICATION NO. 0600X-SP-E0025.

WASHINGTON CLOSURE HANFORD		JOB NO. 1169	
SUPPLIER/CONTRACTOR DOCUMENT STATUS SHEET			
1	Work was prepared.		
2	Revised and resubmitted. Work may proceed after review.		
3	Revised and resubmitted. Work may proceed after review. (if resubmitted comments)		
4	Revised and resubmitted. Work may not proceed.		
5	Permission to proceed not required.		

W.A. [Signature] 11-23-2009

DOCUMENT NUMBER: 0600X-DD-E0230-015

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WCH - DOCUMENT CONTROL

THE CONTROL AND TELEMETRY PANEL DESIGNS FROM PREVIOUS CELLS IS USED TO BE CONSISTENT WITH PREVIOUS CELLS.



DOCUMENT CONTROL [Signature]

REV.	DATE	DESCRIPTION	DRWN BY	DRAFT CHK	ORIG/ ENGR	ENGR CHK	SYS ENGR	PROJ ENGR
1	11/23/09	ISSUED FOR AWARD	W	R	R	N/A		

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON

WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
CONTROL PANEL ARRANGEMENT DETAILS

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDF0230.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-E0230	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
11-6-16471 SHT01	600G	7502

NOTES

- CELL 9 CONFIGURATION IS SHOWN. CELL 10 IS SIMILAR EXCEPT DEVICE NUMBERING, SEE TABLE "A" ON SHEET 2 FOR DEVICE DESIGNATIONS
- PREFIX CELL 9 WIRES WITH "9-" AND CELL 10 WIRES WITH "10-"
- FLOOD ALARM FOR MH-32, MH-34, MH-35, MH-36, MH-37, MH-38, AND MH-39 SHALL BE LOCATED IN THE CELL 9 TRENCH PUMP CONTROL PANEL.
- FLOOD ALARM FOR MH-33 SHALL BE LOCATED IN THE CELL 10 TRENCH PUMP CONTROL PANEL.
- VERIFY POWER SUPPLY (PS-1) VA RATING IS ADEQUATE TO ADD 3 FLOW TRANSMITTERS FROM DWG 0600X-DD-E0227.
- CONDUIT NO. (C152), SEE DWG 0600X-DD-E0222.
- SEE SPECIFICATION 0600X-SP-E0025 FOR THE PLC CONTROL LOGIC.

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
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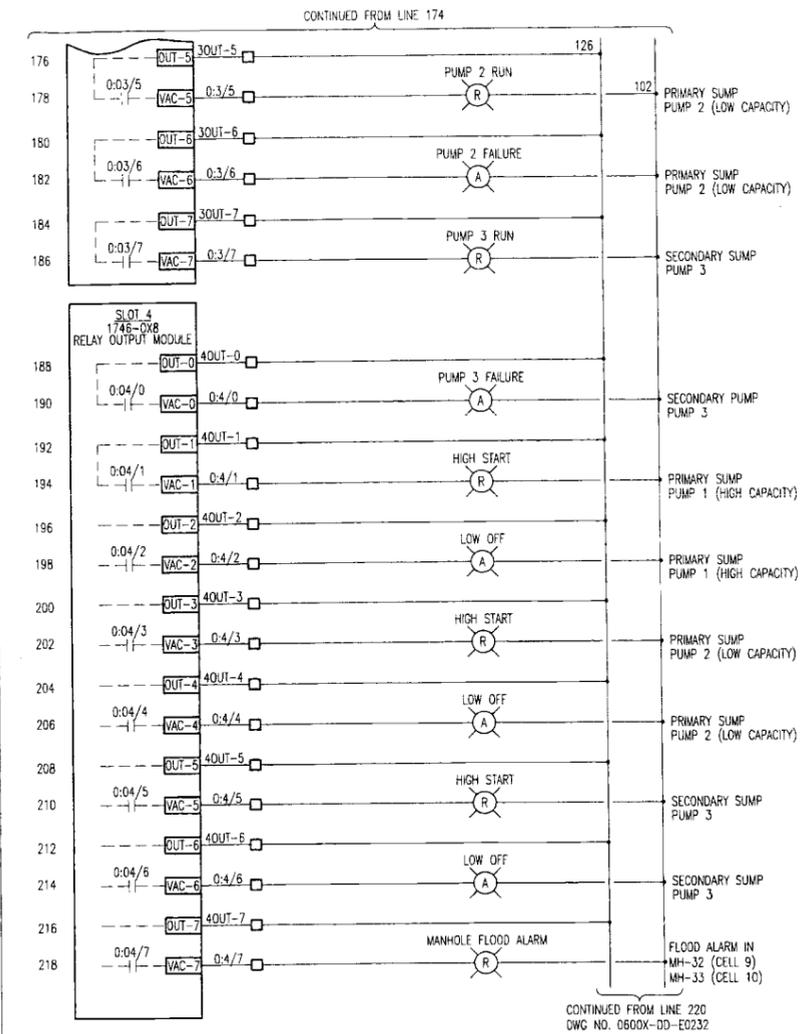
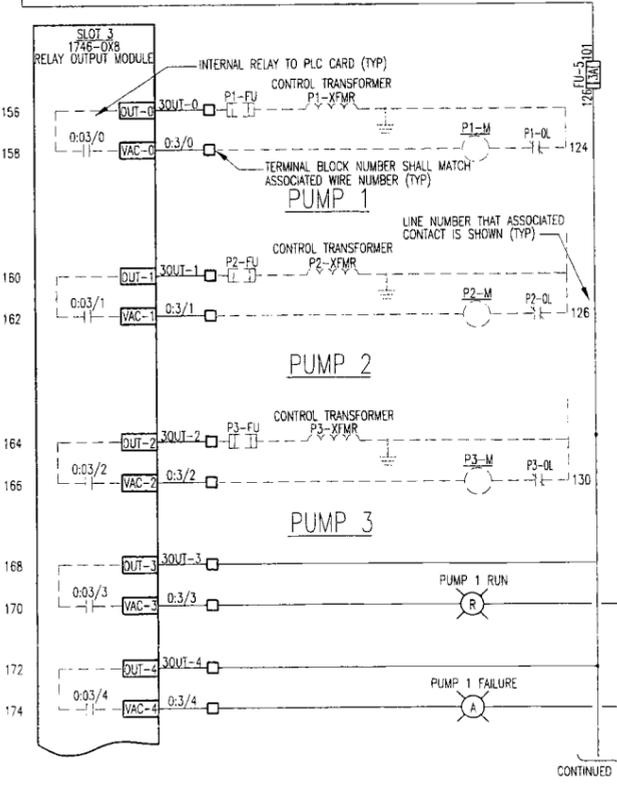
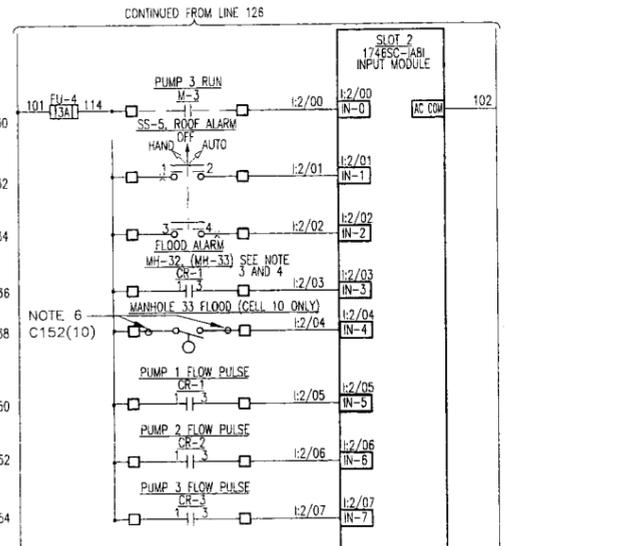
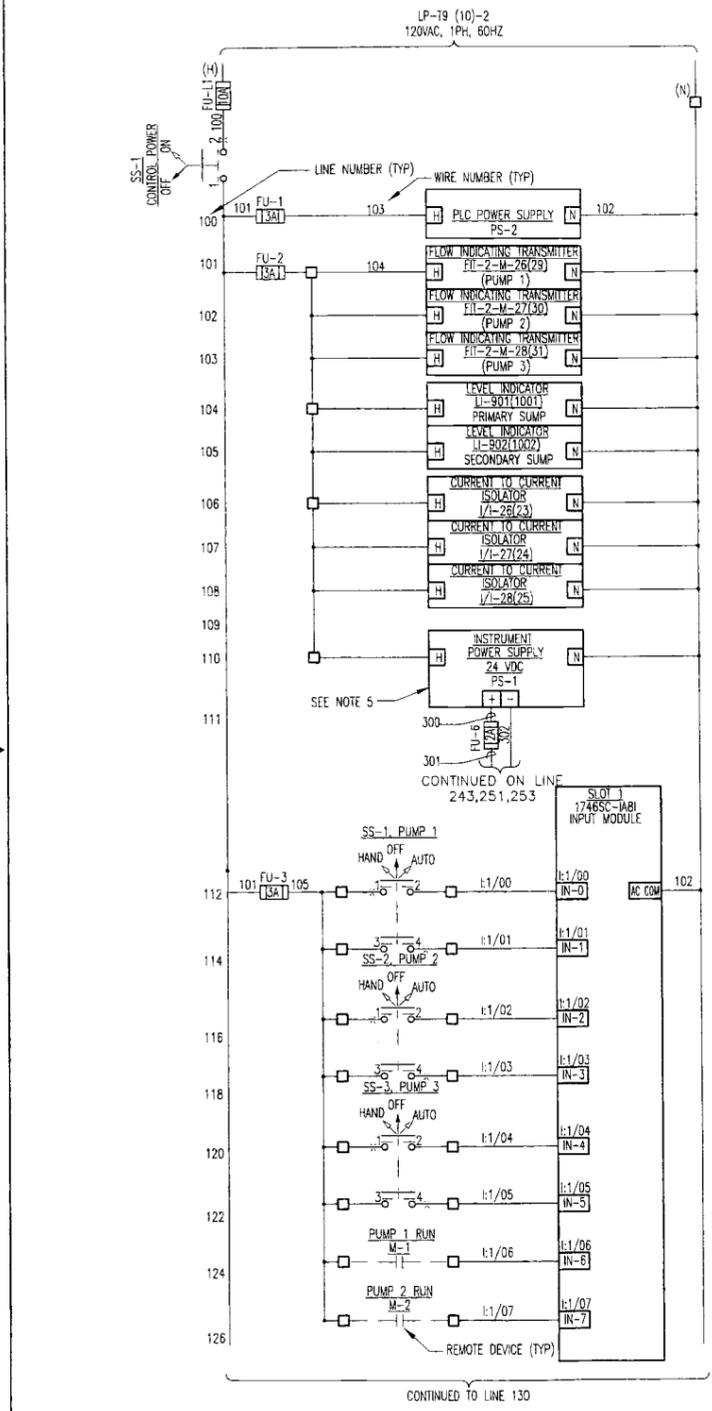
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U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON	WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO
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ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9-10
ELEMENTARY WIRING DIAGRAM - 1

WCH JOB NO. 14655	DOE CONTRACT NO. DE-AC06-05RL-14655	CADD FILENAME 6XDE0231.DWG
TASK ERDF	DRAWING NO. 0600X-DD-E0231	REV. NO. 0

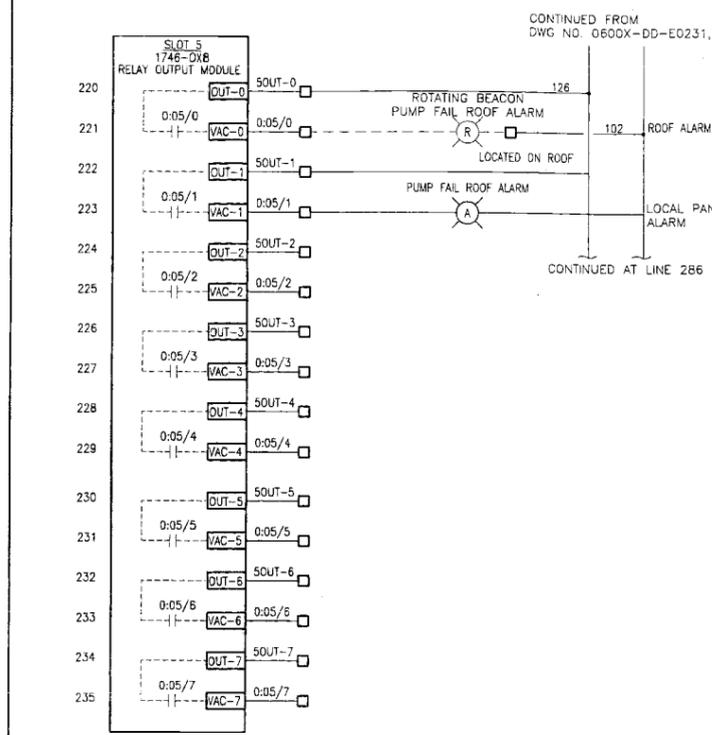


TRENCH PUMP CONTROL PANEL ELEMENTARY DIAGRAM
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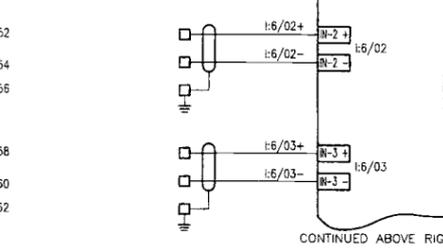
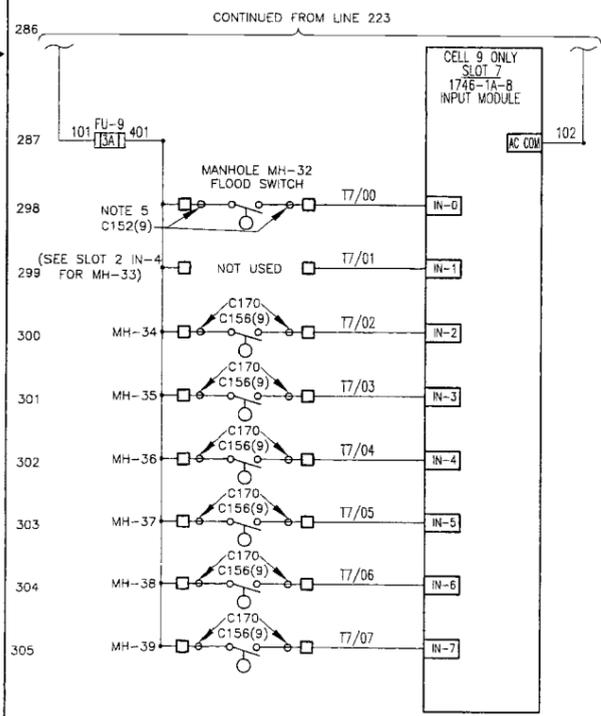
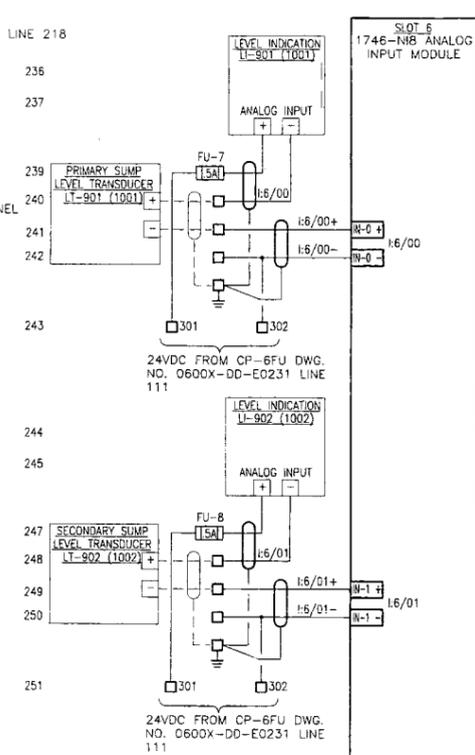
RECORD INFORMATION

RECORD NO. H-6-16472 SHT01	BLDG NO. 600G	INDEX NO. 7502
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2004 WCH-000006 BY: [Signature]



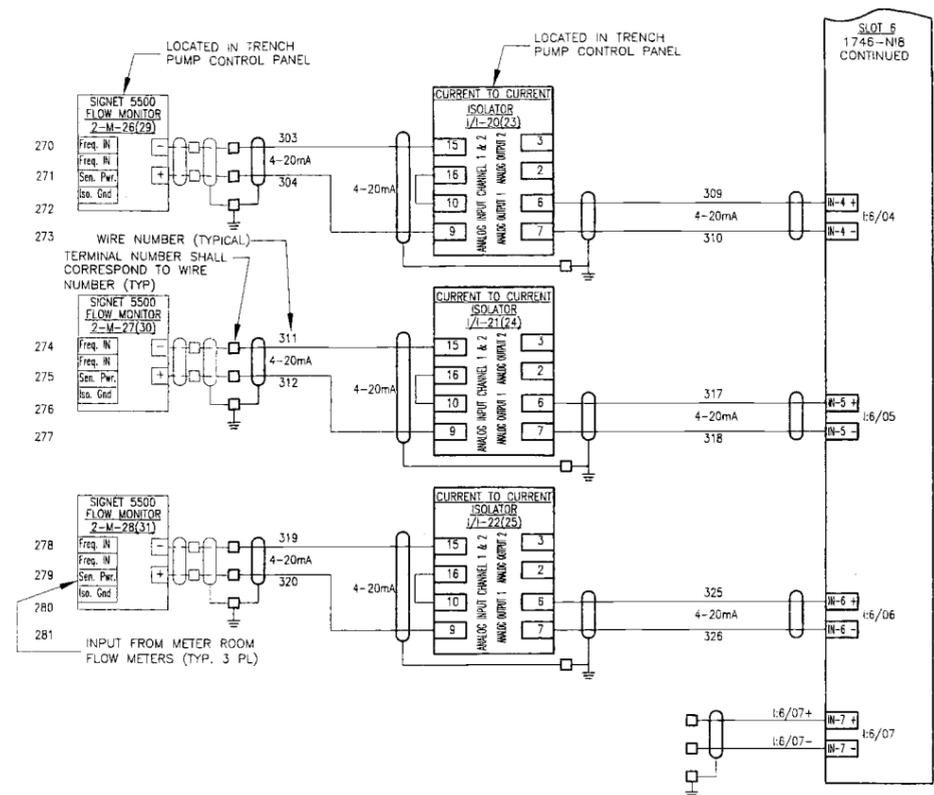
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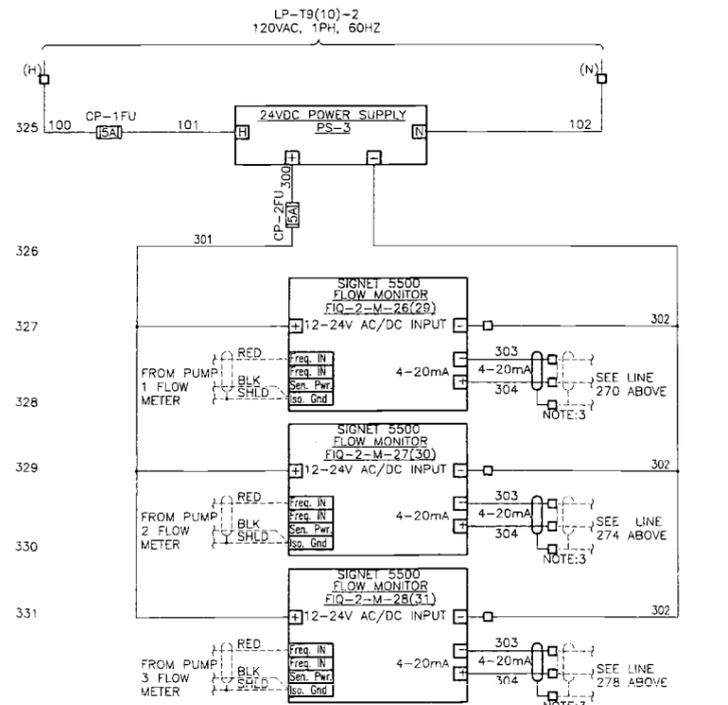
TRENCH PUMP CONTROL PANEL ELEMENTARY DIAGRAM

TABLE "A"

CELL	DIGITAL FLOW METER	CURRENT TO CURRENT TRANSMITTER	FLOW INDICATOR	PUMP
9	2-M-26	1/1-20	FIT-2-M-26	PUMP 1
9	2-M-27	1/1-21	FIT-2-M-27	PUMP 2
9	2-M-28	1/1-22	FIT-2-M-28	PUMP 3
10	2-M-29	1/1-23	FIT-2-M-29	PUMP 1
10	2-M-30	1/1-24	FIT-2-M-30	PUMP 2
10	2-M-31	1/1-25	FIT-2-M-31	PUMP 3



LEACHATE FLOW MEASUREMENT LOOP DIAGRAM



SIGNET FLOW TRANSMITTER ELEMENTARY DIAGRAM

(LOCATED IN THE TRENCH PUMP CONTROL PANEL)

CONTINUED FROM 262

NOTES

- CELL 9 CONFIGURATION IS SHOWN, CELL 10 IS SIMILAR EXCEPT DEVICE NUMBERING. SEE TABLE "A" ON THIS SHEET FOR DEVICE DESIGNATORS.
- PREFIX CELL 9 WIRES WITH "9-" AND CELL 10 WIRES WITH "10-".
- EQUIPMENT AND DEVICES ARE SHOWN IN THEIR GENERAL LOCATIONS. DEVIATIONS MAY BE MADE AS REQUIRED TO ALLOW CABLE ROUTING AND TO AVOID INTERFERENCES.
- AN ALARM TRACEABLE TO EACH MANHOLE FLOOD SWITCH SHALL BE RELAYED TO THE MASTER TELEMETRY PANEL. SCADA CONTROL COMPUTER LOCATED IN BUILDING NO. MO-481. THE CONTROL COMPUTER SHALL BE ABLE TO IDENTIFY THE FLOOD SWITCH ACTIVATING THE ALARM.
- CONDUIT NO. (C152), SEE DRAWING 0600-DD-E0221.
- SEE SPECIFICATION 0600X-SP-E0025 FOR THE PLC CONTROL LOGIC.

WASHINGTON CLOSURE HANFORD SUPPLIER/CONTRACTOR DOCUMENT STATUS STAMP

1. Work in progress
2. Issue for review
3. Review not required. Work may proceed after reevaluation subject to escalation of indicated comments.
4. Permit and release. Work may not proceed.
5. Permission to proceed not required.

Formal review is required. Review does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/contractor and does not relieve the supplier/contractor from full compliance with contractual obligations or release any liability placed on the contract.

W.A. [Signature] 11-23-2009
SOWXSD4000N03-05-014-017

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SCALE: AS SHOWN

U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD, LLC. WEAVER BOOS CONSULTANTS, LLC.
RICHLAND, WASHINGTON DENVER, COLORADO

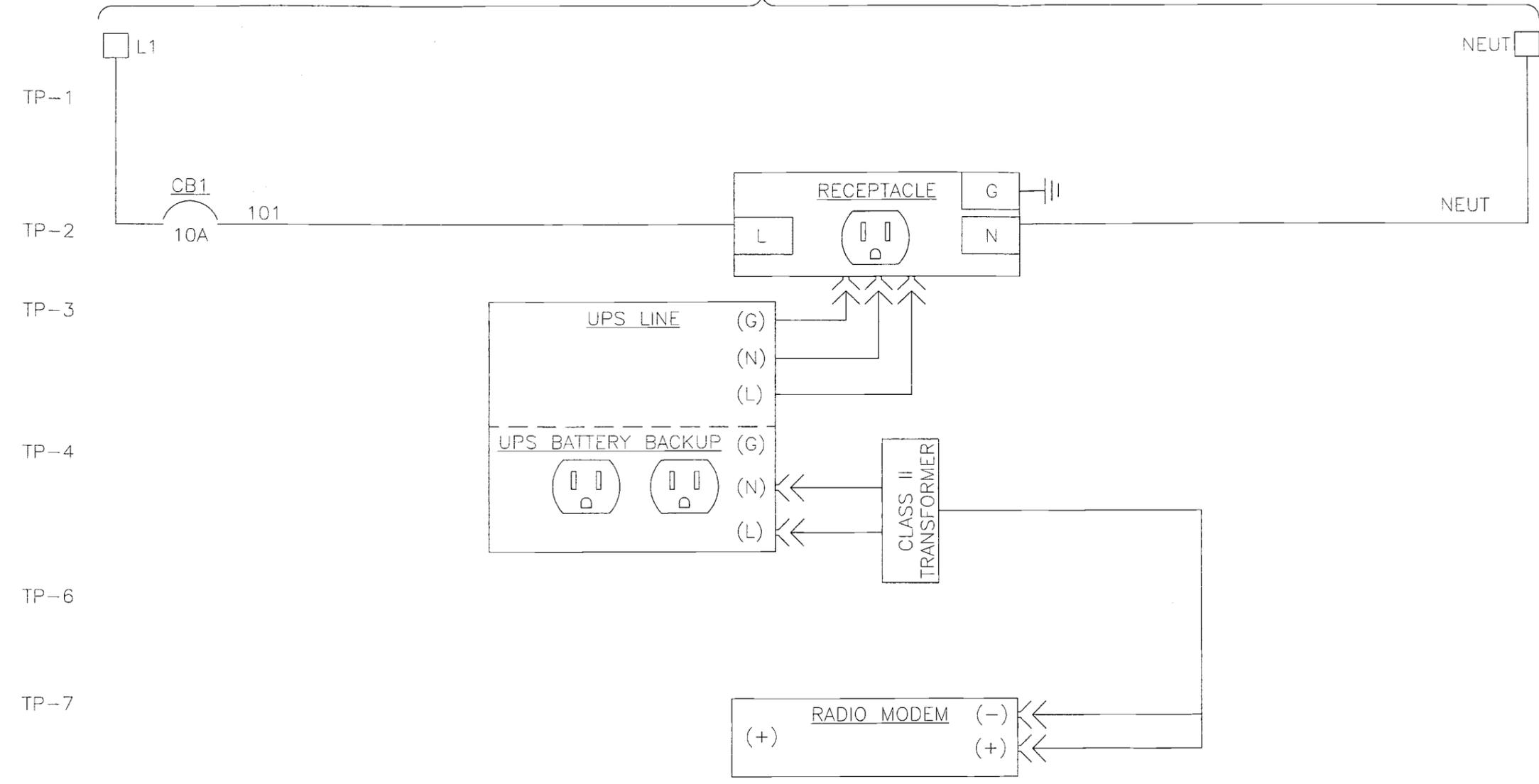
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
ELEMENTARY WIRING DIAGRAM - 2

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0232.DWG
TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-E0232	0

RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16473 SHT01	600G	7502

120VAC, 20A, PANELBOARD LP-T9(10)-18



WASHINGTON CLOSURE HANFORD JOB NO. 14655
 SUPA GRANT/CONTRACTOR DOCUMENT STATUS STAMP

1) Work may proceed
 2) Review and resubmit. Work may proceed after re-submission subject to reviewer's individual comments.
 3) Review and resubmit. Work may not proceed.
 4) Re-submission to proceed not required.

Permitted to proceed does not constitute acceptance or approval of design details, calculations, analysis, test methods, or materials developed or selected by the supplier/contractor and does not relieve supplier/contractor from full compliance with contract requirements or release any "hold" placed on the contract.

DATE	BY	REVISION
11-23-2009	W.A. Tolson	1

SOA 524400003-05-014-019

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 NOV 21 2009
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THE CONTROL AND TELEMETRY PANEL DESIGNS FROM PREVIOUS CELLS IS USED TO BE CONSISTENT WITH PREVIOUS CELLS.



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REV.	DATE	DESCRIPTION	DRAWN BY	DRAFT CHK	ORIG/ ENGR	ENCHK	SYS ENGR	PRG ENGR	

CELLS NO. 9 & 10 TELEMETRY PANEL ELEMENTARY DIAGRAM

(SEE 0600X-DD-E0233 FOR PANEL ARRANGEMENT DETAILS)

SCALE: NA

U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE HANFORD LLC. RICHLAND, WASHINGTON	WEAVER BOOS CONSULTANTS, LLC. DENVER, COLORADO
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ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
 CELLS 9-10
 TELEMETRY PANEL ELEMENTARY DIAGRAM

WCH JOB NO.	DOE CONTRACT NO.	CADD FILENAME
14655	DE-AC06-05RL-14655	6XDE0234.DWG

TASK	DRAWING NO.	REV. NO.
ERDF	0600X-DD-E0234	0



RECORD INFORMATION

RECORD NO.	BLDG NO.	INDEX NO.
H-6-16475 SHT01	600G	7502

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TABLE OF CONTENTS

SH-1.0 PURPOSE/SCOPE	4
SH-2.0 CODES, STANDARDS, LAWS AND REGUALTIONS	4
SH-3.0 DEFINTIONS.....	5
SH-4.0 SAFETY AND HEALTH REQUIREMENTS	6
SH-4.1 GENERAL SAFETY AND HEALTH REQUIREMENTS	6
4.1.01 SAFETY MANAGEMENT SYSTEMS (ISMS)	6
4.1.02 SAFETY AND HEALTH PROGRAM.....	8
4.1.03 HAZARD COMMUNICATION.....	11
4.1.04 EXPLOSIVES	12
4.1.05 EMERGENCY PREPAREDNESS	12
4.1.06 REPORTING ACCIDENTS AND INCIDENTS.....	14
4.1.07 BULLETIN BOARDS	15
4.1.08 GENERAL EMPLOYEE TRAINING	16
4.1.09 FIRE PROTECTION-GENERAL.....	18
SH-4.2 CONSTRUCTION SAFETY & HEALTH REQUIREMENTS.....	20
4.2.01 GENERAL	20
4.2.02 HAZARD ANALYSIS.....	21
4.2.03 INSPECTIONS AND HAZARD ABATEMENT.....	22
4.2.04 FIRE PROTECTION-FIELD	22
4.2.05 CONTROL OF HAZARDOUS ENERGY AND MATERIALS (LOCKOUT/TAGOUT).....	23
4.2.06 HOISTING AND RIGGING.....	23
4.2.07 MEETINGS	23
4.2.08 ELECTRICAL SAFETY PRACTICES	23
4.2.09 EXCAVATIONS.....	23
4.2.10 TASK SAFETY AWARENESS (TSA) PROGRAM	24
4.2.11 INDUSTRIAL HYGIENE	24
4.2.12 FALL PROTECTION	24
4.2.13 TEMPERTURE EXTREMES.....	24
SH-4.3 HAZARDOUS WASTE & RADIOLOGICAL REQUIREMENTS.....	25
4.3.01 GENERAL	25
4.3.02 SITE-SPECIFIC HEALTH AND SAFETY PLAN	25
4.3.03 RADIOLOGICAL PROTECTION	25
4.3.04 DOSIMETRY (SEE FIGURE 2 – ISSUE OF CONTRACTOR – THERMO-LUMINESCENT DOSIMETER (TLD)	25
4.3.05 PERSONAL PROTECTIVE EQUIPMENT	25
4.3.06 RESPIRATORY PROTECTION.....	26
4.3.07 MEDICAL SURVEILLANCE.....	26
4.3.08 TRAINING	26
4.3.09 EMPLOYEE JOB TASK ANALYSIS (EJTA).....	26
SH-5.0 SUBMITTALS AND AVAILABLE DOCUMENTATION.....	28
5.1 SUBMITTALS	28

5.2 AVAILABLE DOCUMENTS 32

SH-6.0 FORMS 33

SH-7.0 ATTACHMENTS 34

- G-01 INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS) MATRIX
- G-02 SUBCONTRACTOR'S MONTHLY ACCIDENT AND INJURY/ILLNESS REPORT
- G-03 ACCIDENT/INCIDENT INVESTIGATION REPORT
- G-04 TRAINING & MEDICAL SURVEILLANCE
- G-05 TASK SAFETY AWARENESS CARD**
- G-06 WCH SUBCONTRACTOR WORKER SAFETY AND HEALTH PROGRAM PLAN
(COMPLIANCE MATRIX IS LOCATED ON PROCUREMENT WEB PAGE)

SH-7.0 ATTACHMENTS

PSD-8, WASHINGTON CLOSURE HANFORD 10 CFR 851 COMPLIANCE MATRIX

**SUBCONTRACTOR CONTROL OF HAZARDOUS ENERGY AND MATERIALS
(LOCKOUT/TAGOUT): PROFORMA PROCEDURE**

FALL PROTECTION FORMS

- WCH-TR-031, Qualified/Competent Person Qualification Form
- WCH-QSH-027, Ladder Use Approval Form
- WCH-QSH-039, Scaffolding Inspection Form
- WCH-QSH-040, Scaffolding Safety Checklist
- WCH-QSH-050, Fall Hazard Protection Analysis
- WCH-SH-215, Heat Stress Monitoring
- WCH-SH-263, Industrial Hygiene Heart Rate Monitoring

FIGURES

Figure 1. Hanford General Employee Training 17

Figure 2. Issue of Contractor TLD. 26

Figure 3. Hazardous Waste Worker and Rad Worker Training Matrix. 26

NOTE: All non-applicable Requirements are 'grayed out' in the Table of Contents, Forms and/or Submittal Lists.

SUBCONTRACTOR SAFETY AND HEALTH REQUIREMENTS

SH-1.0 PURPOSE/SCOPE

The requirements of this document are based on current conditions and/or operations in areas of the planned project. This document is to be used to assist the SUBCONTRACTOR in understanding the safety and health requirements of a specific project. This document does not relieve the SUBCONTRACTOR of the requirement to plan for or provide a safe Work Site. This document does not relieve the SUBCONTRACTOR or its subtier Subcontractor(s) from recognizing and complying with applicable local, state and federal regulations. The term "personnel" includes both SUBCONTRACTOR and its subtier Subcontractors' personnel.

The "Subcontractor Safety and Health Requirements" provide specific instruction to Subcontractors in areas where there are CONTRACTOR requirements in addition to regulatory requirements, or where emphasis is needed in portions of the regulations to ensure uniformity between the Subcontractor's program and those of the Contractor's operations and/or operations of other site contractors.

Exhibit G incorporates all requirements of DEAR 970.5223-1, 10 CFR 851 [10 CFR 851.10], DOE Order 440.1A, and RRD 005, Rev. 3 and is hereby flowed down to SUBCONTRACTORS and its lower tiers. Portions of this Exhibit implement requirements of the WCH Worker Safety and Health Program Plan for compliance to 10 *Code of Federal Regulations* (CFR) 851, "Worker Safety and Health Program" and are bracketed in the text.

SH-2.0 CODES, STANDARDS, LAWS and REGULATIONS

- A. In addition to the SUBCONTRACTOR safety, health, and radiological control requirements listed in this document, the SUBCONTRACTOR shall comply with the most recent edition (unless otherwise noted) of the following (list is non-inclusive):
1. 48 CFR 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution, Title 48, *Code of Federal Regulations*, (DEAR) Section 970.5223-1, as amended, U.S. Department of Energy, Washington, D.C.
 2. Title 10, CFR, Part 850 and 851, "Chronic Beryllium Disease Prevention Program; Worker Safety and Health Program – Final Rule."
 - 2A. WCH-4, Appendix J, "Integrated Environment, Safety, and Health Management System Description, WCH Subcontractor Worker Safety and Health Program Plan."
 - 2B. Title 29 of the Code of Federal Regulations (CFR), Part 1910, "Occupational Safety and Health Standards."
 - 2C. Title 29 CFR, Part 1926, "Safety and Health Regulations for Construction."
 - 2D. PSD-8, "Washington Closure Hanford 10 CFR 851 Compliance Matrix."

3. Title 10, CFR, Part 835, "Occupational Radiation Protection."
 - 3A. WCH-100, "Washington Closure Hanford Radiation Protection Program for the 10 CFR 835 Revision," April, 2006.
4. ANSI Z88.2, Practices for Respiratory Protection.
5. ANSI Z49.1, Safety in Welding, Cutting and Allied Processes, Sections 4.3 and E4.3 (of the 1994 edition or equivalent sections of subsequent editions).
6. DOE-M-440.1-1A, DOE Explosives Safety Manual, Attachment 2, "Contractor Requirements Document" [10 CFR 851, Appendix A]
7. National Fire Protection Association (NFPA) 70, National Electrical Code (2005).
8. NFPA 70E, Electrical Safety Requirements for Employee Workplaces (2004).
9. American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices" (most recent edition), when ACGIH Threshold Limit Values (TLVs) are lower (more protective) than Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits. [When ACGIH TLVs are used as exposure limits, SUBCONTRACTOR operations shall nonetheless comply with the other provisions of any applicable OSHA-expanded health standard.] The TLVs for exposures to laser emissions in the ACGIH Indices are excluded from this requirement.

SH-3.0 DEFINITIONS

None.

SH-4.0 SAFETY AND HEALTH REQUIREMENTS

In performance of work under this subcontract, the SUBCONTRACTOR shall comply with the following CONTRACTOR safety, health, and radiological control requirements.

SH-4.1 GENERAL SAFETY AND HEALTH REQUIREMENTS

4.1.01 SAFETY MANAGEMENT SYSTEMS (ISMS)

A. The CONTRACTOR embraces the philosophy of an integrated safety management system that includes environmental, safety, and health requirements in the work planning and execution processes and ensures protection of the worker, the public, the environment, and property. The CONTRACTOR'S expectations for integrated safety management are based on the complexity and hazards associated with the Work and include the (1) described functions, components, processes, and interfaces (system map or blueprint) and (2) personnel who execute those assigned roles and responsibilities to manage and control the ISMS. Line management responsibility, clear roles, and balanced priorities are essential elements of ISMS.

DEAR 970-5223-1 requires that the SUBCONTRACTOR integrate the CONTRACTOR'S ISMS core functions and guiding principles into all work planning and execution. WCH's core functions and guiding principles are as follows:

ISMS Guiding Principles

- Line management responsible for safety and environmental requirements
- Clear roles and responsibilities
- Competence commensurate with responsibilities
- Balance priorities
- Identification of safety standards and requirements
- Hazard controls tailored to work being performed
- Operations authorization
- Worker involvement
- Communication and stakeholder involvement
- Continuous improvement
- Senior management involvement

ISMS Core Function

- Establish ES&H policies
- Define the scope of work
- Identify and analyze the hazards
- Develop and implement hazards controls
- Perform work within controls
- Provide feedback and continuous improvement
- Management review

B. The SUBCONTRACTOR shall demonstrate that the mechanisms are in place to direct, monitor and verify implementation of ISMS. The key elements provided by the CONTRACTOR below reflect the minimum expectations required for implementation of the SUBCONTRACTOR program related to the site and individual activities. The SUBCONTRACTOR is encouraged to use the Integrated Safety Management System Matrix, Form G-01 (see "Forms" Section), as a guide for implementation of ISMS.

1. MANAGEMENT OVERSIGHT

Procedures and/or mechanisms are in place and utilized that:

- a. Define clear line management roles and responsibilities within the SUBCONTRACTOR'S organization and activities to ensure that safety is maintained at all levels.

- b. Ensure that personnel who supervise work are competent commensurate with their responsibilities.
- c. Incorporate the best practices of the various safety initiatives (e.g., Job Hazard Analysis, etc.).
- d. Emphasize management review and resolution of recommendations for improvement, including worker suggestions.
- e. Encourage personnel to provide information and feedback for self-assessments, continuous improvement, and occurrence reporting as well as routine observations.
- f. Develop feedback and improvement opportunities at the site, as well as the individual level, and ensure that information developed is utilized to provide feedback and improvement applicable to future similar/related activities.

2. HAZARD IDENTIFICATION

Procedures and/or mechanisms are in place and utilized that:

- a. Using the Integrated Work Control Program, ensure that hazards associated with the work have been identified and analyzed and personnel responsible for the analysis of environmental, health or safety concerns work closely with those assigned to analyze and control the hazards for the site/activity.
- b. Provide direction and approval from line management and integration of requirements.
- c. Ensure personnel whose roles are to identify and analyze hazards are competent to execute the responsibilities.
- d. Include workers in the identification and determination of hazards.
- e. Implement appropriate controls for mitigation of hazards present at the site/activity.

3. OPERATIONS

Procedures and/or mechanisms are in place and utilized that:

- a. Using the Integrated Work Control Program, ensure work planning (standards and requirements) integrated at the individual or activity level fully analyzes hazards and develops appropriate controls, prior to authorization of work or commencement of operations.
- b. Ensure a process is established to confirm site, activity and operations work force readiness prior to authorization for start of work.
- c. Ensure a process is established that authorizes operations to be conducted.

- d. Ensure adequate performance measures and indicators (balanced priorities), including safety performance measures, are established for the work.
- e. Ensure workers actively participate in the work planning process through activities including Plan of the Day (POD) and Task Safety Awareness (TSA) briefings.
- f. Ensure work documents demonstrate effective integration of safety management.
- g. Ensure verification of ISMS flows down to all subtier contractors and vendors.
- h. During work or following task completion, provide mechanism for feedback of lessons learned and opportunities for improvement.

See "Forms" Section: Form G-01, "Integrated Safety Management System Matrix."

Required Subcontractor Submittals (see Exhibit I)

- Written verification of adherence to ISMS (e.g. Form G-01, "Integrated Safety Management System Matrix or equivalent.) (4.1.01.B) [2-01]

4.1.02 SAFETY AND HEALTH PROGRAM

- A. SUBCONTRACTORS shall establish and maintain a written Safety and Health Program in accordance with SH-4.1.02, (and SH-4.3.01, if applicable) specifying the methods, programs and procedures used to implement the safety and health of all persons on the Jobsite including their employees, employees of other contractors, subtiers, visitors, and the public [10 CFR 851.20]. For purposes of Exhibit G, Safety and Health functional areas identified in the Safety and Health Program are referred to as individual programs (e.g., Explosives, Industrial Hygiene, Hazards Communication, Security, Electrical). As part of the Safety and Health Program submittal, the SUBCONTRACTOR is required to complete Form G-06, "WCH Subcontractor Worker Safety and Health Program Plan", (see "Forms" Section), which meets the 10 CFR 851, "Worker Health and Safety Program" requirements.
- B. The SUBCONTRACTOR shall adopt the WCH "Zero Accident" philosophy in performance of the Work under this subcontract, ensuring it is communicated to and fully understood by all levels of SUBCONTRACTOR'S organization. In its promotion of this philosophy, the SUBCONTRACTOR shall incorporate into its Safety and Health Program methods and strategies to prevent work related accidents, incidents, injuries, and illnesses.
- C. The SUBCONTRACTOR shall have a site-specific safety orientation for all personnel who will perform work on the project. The CONTRACTOR shall have a designated representative contribute a safety message to this orientation.
- D. The SUBCONTRACTOR shall endorse and proactively participate in safety programs including but not limited to the Voluntary Protection Program (VPP), the Local Safety Improvement Teams (LSIT), and the Task Safety Awareness program [10 CFR 851.20]. The SUBCONTRACTOR shall make available at least one craft representatives from each trade to serve on an LSIT. As a minimum, the LSIT will meet monthly (up to one hour) outside of the normal break periods. The LSIT will be run, chaired, and comprised primarily of SUBCONTRACTOR and CONTRACTOR craft; however, SUBCONTRACTOR management shall participate and support the success of the

LSIT. Additionally, the SUBCONTRACTOR shall make a craft representative available to represent the project during monthly and/or quarterly VPP/LSIT meetings with other SUBCONTRACTORS and/or CONTRACTOR management.

- E. The LSIT will sponsor and maintain a project/work place Safety Log Book. The Safety Log Book will be available to SUBCONTRACTOR and CONTRACTOR staff to document their input regarding safety issues, conditions, or concerns needing resolution. Individuals should feel free to make entries into the Safety Log Book, without fear of reprisal, and should expect timely responses to log book entries. Ownership (assignment of actions), completion dates, and responses to the actions (including closures) within the Safety Log Book will be coordinated by the LSIT and concurred with by SUBCONTRACTOR and CONTRACTOR management. The location and expected use of the Safety Log Book will be part of initial safety indoctrination for SUBCONTRACTORS with periodic reminders encouraging use of the Safety Log Book provided through CONTRACTOR and SUBCONTRACTOR routine safety communications processes. The Safety Log Book will be the property of the CONTRACTOR. The Safety Log Book will be maintained in a neutral CONTRACTOR work location agreed upon by SUBCONTRACTOR and CONTRACTOR that is convenient for employees to submit and check the status of items entered into the Safety Log Book.
- F. The SUBCONTRACTOR Safety and Health Program shall be supported by either a Certified Industrial Hygienist (CIH) or Certified Safety Professional (CSP) to ensure the technical and cultural aspects of safety and health are met [10 CFR 851.20]. Persons working within the SUBCONTRACTOR's authority must meet one of the following criteria:
1. Construction Health Safety Technician (CHST),
 2. Occupational Health and Safety Technician (OHST),
 3. Associated Safety Professional (ASP),
 4. Industrial Hygienist in Training (IHIT) or Certified Associate Industrial Hygienist (CAIH),
 5. Equivalency in experience with approval from the STR/Project Safety Representative.
- G. The SUBCONTRACTOR Safety and Health Program shall include provisions for meeting worker's rights contained within 10 CFR 851 and RRD 005, Rev.3. Every SUBCONTRACTOR employee performing work on the Hanford Site has the following guaranteed rights, without fear of reprisal:
1. Participate in activities described in this policy on official time [10 CFR 851.20].
 2. Have access to safety and health publications, programs, standards, controls, procedures, and posters applicable to the RCCC. Have limited access to recordkeeping log (OSHA Form 300) and DOE Form 5484.3 (OSHA Form 301) that contains the employee's name as the injured or ill worker [10 CFR 851.20].
 3. The right to actively participate in onsite Voluntary Protection Program activities if the organization either has VPP recognition or is seeking VPP recognition [RRD 005, Rev. 3].

4. The right to hazard information associated with work tasks, provided in a timely manner [RRD 005, Rev. 3].
 5. The right to contribute to job hazard analysis, employee job task analysis, accident investigations, pre-job planning, worksite inspections, assessments, safety meetings, safety committee activities, special task teams, policy/procedure development, safety training, safety goals, and objectives, etc [RRD 005, Rev. 3].
 6. The right to personal protective equipment as required by the hazards associated with the activity or work location or to use a respirator voluntarily. PPE shall be provided by the employer unless agreements specify that it must be provided by the employee [RRD 005, Rev. 3].
 7. The right to identify error precursor tasks and conditions. Practice error reduction techniques, and participate in activities designed to minimize human performance related events [RRD 005, Rev. 3].
 8. Express concerns related to worker safety and health [10 CFR 851.20].
 9. The right to request and observe personal exposure monitoring for toxic materials and harmful physical agents if there is a reasonable potential for exposure, and access to the records of acquired monitoring, bioassay, and exposure data [10 CFR 851.20 and RRD 005, Rev. 3].
 10. Be notified when monitoring results indicate overexposure to hazardous materials [10 CFR 851.20].
 11. The right to access personal safety and health records maintained by the employer [RRD 005, Rev. 3].
 12. Have a representative authorized by employees accompany the SUBCONTRACTOR or his authorized personnel during the physical inspection of the workplace for the purpose of aiding the inspection. When no authorized employee representative is available, the SUBCONTRACTOR or his authorized representative must consult, as appropriate, with employees on matters of worker safety and health [10 CFR 851.20].
 13. The right to request that the employer perform a work place inspection and the right to receive results from work place inspections and accident investigations performed by the SUBCONTRACTOR and/or CONTRACTOR [10 CFR 851.20 and RRD 005, Rev. 3].
 14. Decline to perform an assigned task because of reasonable belief that, under the circumstances, the task poses a imminent risk of death or serious physical harm to the worker coupled with a reasonable belief that there is insufficient time to seek effective redress through normal hazard reporting and abatement procedures [10 CFR 851.20].
 15. Stop work when the worker discovers employee exposures to imminently dangerous conditions or other serious hazards; provided that any stop work authority must be exercised in a justifiable and responsible manner in accordance with established procedures [10 CFR 851.20].
- H. These rights are guaranteed and it is the responsibility of SUBCONTRACTOR management, employees and unions to uphold these rights and respect those that invoke them for their personal

safety or the safety of others. These rights shall be communicated to all employees including SUBCONTRACTOR employees. SUBCONTRACTORS are required to screen disciplinary actions for indications of post retaliation of protected activities before implementation.

Required Subcontractor Submittals (see Exhibit I)

- Written SUBCONTRACTOR Safety and Health Program. (4.1.02.A) [2-02]
- Form G-06, "Subcontractor Worker Safety and Health Program Plan" (4.1.02.A) [2-03]
- PSD-8, "Washington Closure Hanford 10 CFR 851 Compliance Matrix" (4.1.02.A) [2-04]
- List of Key Supervisory and Safety & Health personnel. (4.1.02.F) [2-08]

4.1.03 HAZARD COMMUNICATION

- A. SUBCONTRACTORS shall establish and maintain a written Safety and Health Program that includes a Hazard Communication Program (if applicable) established in accordance with SH-4.1.02, (and SH-4.3.01, if applicable) and specifies procedures used to implement the Hazard Communication Program [10 CFR 851.25].
- B. In performance of work under this subcontract the SUBCONTRACTOR shall comply with the following CONTRACTOR/OWNERS Hazard Communication Program requirements (but not limited to):
1. Prior to start of work, employees shall receive hazard communication program training per OSHA 29 CFR 1910.1200 (h) or 29 CFR 1926.59 (g) [10 CFR 851.25].
 2. Current Material Safety Data Sheets (MSDSs) for each material brought onto the Hanford Site shall be maintained by the SUBCONTRACTOR. The information contained in the MSDS shall meet the requirements of OSHA 29 CFR 1910.1200 (g) or 29 CFR 1926.59 (g), "Material Safety Data Sheets."
 3. A current list of hazardous materials and associated MSDSs for all hazardous materials in use or stored shall be kept at the Jobsite and be readily available to employees and the CONTRACTOR.
 4. All containers, original and secondary, shall be labeled and stored in accordance with OSHA 29 CFR 1910.1200 (f) or 29 CFR 1926.59(f), "Labels and Other Forms of Warning."
 5. Manage and inventory all hazardous chemicals brought onto the project site, to maintain labels and MSDSs, and to participate in the Hanford Site MSDS Database Program.

Required Subcontractor Submittals (see Exhibit I)

- Written Hazard Communication Program and procedures. (may be included as part of SH-4.1.02, Safety and Health Program submittal). (4.1.03.A) [2-02a]

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- List of Hazardous Materials and associated MSDS. (4.1.03.B) [2-51]

4.1.04 EXPLOSIVES

- Clause not applicable.

4.1.05 EMERGENCY PREPAREDNESS

A. SUBCONTRACTORS must arrange for their own first aid treatment. However, where the CONTRACTOR or OWNER have first aid facilities on the Hanford Site, their first aid facilities are available for treatment of SUBCONTRACTOR employees for life threatening injuries or illness while engaged in performance of Work under this subcontract. The SUBCONTRACTOR is responsible for all medical costs (facility use) of whatever nature regardless of the facility elected to be utilized by the SUBCONTRACTOR. The SUBCONTRACTOR shall follow the requirements below for reporting emergencies.

1. REPORTING ON-SITE EMERGENCIES

- a. When reporting on-site emergencies by Land Line Telephone **DIAL 911**
- b. When reporting on-site emergencies by Cellular Telephone **DIAL 373-3800**

Hanford Site Outer Area First Aid Station

200 West - 2719 WB Building

Hours: 7:30 am - 4:00 p.m., Monday - Friday, except holidays

4:30 p.m. - Midnight, Monday - Friday (Nurse on duty only, no MD or PAC)

7:00 a.m. - 4:00 p.m., Saturdays

1979 Snyder Street First Aid Station

Hours: 7:00 a.m. - 4:30 p.m., Monday - Thursday

7:00 a.m. - 3:30 p.m., Fridays

- 2. Personnel at remote work locations shall have communication equipment to initiate emergency response and to be notified of emergency situations and protective actions.
- 3. All Jobsite supervisors, safety representatives, or persons in direct charge of crews, shall be current in First Aid/CPR training. All electricians and other personnel potentially exposed to electrical shock shall be current in First Aid/CPR training. In the absence of medical treatment in near proximity (within three to four minutes) of a worksite, a person or persons shall be adequately trained to render first aid. Adequate first aid supplies shall be readily available. A minimum of one person, holding a valid certification of First-Aid/CPR training meeting American Red Cross or equivalent criteria, shall be present at all times at each Jobsite if reasonable medical services are not available.
- 4. All SUBCONTRACTOR employees shall report to the Site Occupational Medical Provider (SOMP) for evaluation following a suspected or confirmed chemical exposure event. Follow-up monitoring will be in accordance with the SUBCONTRACTOR'S medical surveillance program as specified in SH-4.3.07 of this exhibit. The requirement to report to the SOMP for a potential/actual chemical exposure evaluation shall be flowed down to any sub-tier contractor performing work for the SUBCONTRACTOR on the Hanford Site.

5. The CONTRACTOR will provide the SUBCONTRACTOR with site-specific emergency action plan information, such as staging areas and evacuation routes. The CONTRACTOR will provide Hanford Site emergency notification information to SUBCONTRACTORS at remote work sites.
 6. The SUBCONTRACTOR may be requested to participate in scheduled and impromptu emergency drills and exercises.
 7. SUBCONTRACTOR personnel are required to respond to project-specific and Hanford Site-wide emergency notification and response alarms and signals. Project-specific alarms and signals can be obtained from the Subcontract Technical Representative (STR) and site-wide alarms and signals can be heard by dialing (509) 373-2345.
 8. SUBCONTRACTOR employees shall be given pre-work orientation to the emergency response and notification requirements of this section. This is provided through general employee training and site specific orientations to work controlling documents such as the SSHASP. Participation in drills provides additional training for site personnel on the specific actions of their building. Each person has the responsibility to:
 - a. Take reasonable action to prevent or mitigate an emergency event.
 - b. Promptly respond to emergency signals.
 - c. Immediately report emergencies using established procedures.
 - d. Immediately report to the CONTRACTOR any condition that may lead to an emergency condition.
- B. Regardless of the facility elected to be utilized by the SUBCONTRACTOR, the SUBCONTRACTOR employee must report to the SOMP for 'Return to Work' release in the following instances:
1. first aid or medical treatment for an injury/illness was provided by a medical provider, other than the SOMC and work restrictions apply or was provided prescription drugs that has the potential of affecting job performance;
 2. if SUBCONTRACTOR employee had surgery (out-patient or inpatient) or injury that may affect job performance;
 3. if the SUBCONTRACTOR employee was absent 5 or more working days (or an equivalent time period for those individuals on an alternative work schedule) due to a medical condition or surgery;
 4. if any item above applies, the SUBCONTRACTOR must notify the WCH Subcontractor Technical Representative (STR) of the work related condition.
- C. All Occupational Medical monitoring will be in accordance with SH-4.3.07.

Required Subcontractor Submittals (see Exhibit I)

- Verification of employee pre-work orientation covering the emergency response and notification requirements. (4.1.05.A.8) [2-05]

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- Verification of First Aid/CPR Certification (Form G-04, "Training and Medical Surveillance"). (4.1.05.A.3) [2-53]

4.1.06 REPORTING ACCIDENTS AND INCIDENTS

- A. SUBCONTRACTORS shall establish and maintain a written Worker Safety and Health Program Plan that includes a Reporting Accidents and Incidents Program (if applicable) established in accordance with SH-4.1.02, (and SH-4.3.01, if applicable) and specifies procedures used to implement the Reporting Accidents and Incidents program.
- B. The SUBCONTRACTOR shall maintain accurate accident and injury/illness logs and, on a monthly basis, submit to the CONTRACTOR (STR) a summary (First Aid and OSHA 300) of accidents and injuries/illnesses and the total number of respective work hours [10 CFR 851.23]. The SUBCONTRACTOR is required to submit the same information for its subtier Subcontractor(s). The monthly report (pertaining to the previous months' activities) of all accidents or injuries/illnesses shall be completed on or before the third working day of each month. The monthly reports are required throughout the duration of the Subcontract, including periods of no work activity. If the duration of Work does not exceed one month, the accident and injury/illness report shall be submitted upon completion of the Work. See "Forms" Section: Form G-02, "Subcontractor Monthly Accident and Injury/Illness Report."
- C. Deaths, injuries (including first aid incidents), damage to property, spills or releases (radiological, chemical, hazardous or regulated materials), and events not resulting in injury, illness or property damage but having had the potential to do so (i.e., near misses) shall be verbally communicated to the CONTRACTOR immediately with written follow-up within 24 hours [10 CFR 851.23].
- D. The following events shall be investigated, documented and reported on the SUBCONTRACTOR'S accident/incident/investigation form (or other CONTRACTOR approved form) or as a minimum, the SUBCONTRACTOR may utilize Form G-03, "Accident/Incident Investigation Report" for submittal to CONTRACTOR:
1. Deaths.
 2. Employee injury or illness cases (including, but not limited to OSHA recordable cases).
 3. Employee exposure to concentrations of toxic and hazardous substances in excess of permissible levels.
 4. Theft, loss, or damage of any property.
 5. Events not resulting in injury, illness or property damage but having had the potential to do so (i.e., near misses).
 6. Environmental incidents – releases and spills.

E. The accident/incident report shall include at a minimum:

1. Activity in progress at the time of the accident/incident.
2. A detailed description of the accident/incident, events leading up to the accident/incident, and the extent of injury or damage.
3. Corrective action(s) planned and taken to prevent reoccurrence.
4. Time frame for implementing corrective action(s).

F. At the discretion of the CONTRACTOR, independent investigations of accidents/incidents may be conducted. In those instances, the SUBCONTRACTOR, to the extent possible, shall:

1. Secure the accident/incident site and prevent change in the location or configuration of equipment and material associated with the accident/incident.
2. Assist in identifying witnesses and securing statements.
3. Assist in post-investigation activities to determine cause(s) and corrective action(s).

G. Cooperate fully in the conduct of inspections by the CONTRACTOR, OWNER, governmental agencies and other agencies of competent jurisdiction, e.g., OSHA. Copies of citation notices by such agencies shall be submitted to the CONTRACTOR immediately upon receipt. The SUBCONTRACTOR shall be prepared to bring their management team to discuss injuries occurring on this contract with the CONTRACTOR President.

H. SUBCONTRACTOR shall be prepared to bring the SUBCONTRACTOR management chain to the CONTRACTOR President's office to discuss any injuries.

Required Subcontractor Submittals (see Exhibit I)

- Written program and procedure for Reporting Accidents and Incidents. (maybe included as part of SH-4.1.02, Safety and Health Program submittal). (4.1.06.A) [2-02c]
- Monthly "Accident and Injury/Illness Report," Form G-02, as required by the General Condition, titled "Environmental, Safety and Health," and Special Condition titled, "Subcontract Schedule." (4.1.06.B) [2-06]
- Written Accident/Incident Investigation Report submitted within 24 hours of verbal notification, using Form G-03, "Accident/Incident Investigation Report," or other CONTRACTOR-approved form. (4.1.06.C, 4.1.06.D) [2-07]

4.1.07 BULLETIN BOARDS

A. Every SUBCONTRACTOR employing eight or more persons shall install and maintain a safety bulletin board at a location where the employees report to work.

- B. Safety bulletin boards shall be sufficient in size to display and post safety bulletins, newsletters, posters, accident statistics, and other safety educational material.
- C. As a minimum safety bulletin boards shall post the following [10 CFR 851.20]:
1. DOE poster, 79105063.1, "Occupational Safety and Health Protection for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities."
 2. DOE form RL-F-5480.4, "Employee Concerns Reporting – DOE."
 3. Dept. of Labor and Industries form P416-081-000, "Job Safety and Health Protection."
 4. "Worker Responsibility" (required only on radiological sites) ("E941124").
 5. OSHA 300A Summary (posted from February 1 to April 30 each year).
 6. CONTRACTOR safety bulletins, publications, and posters as directed.

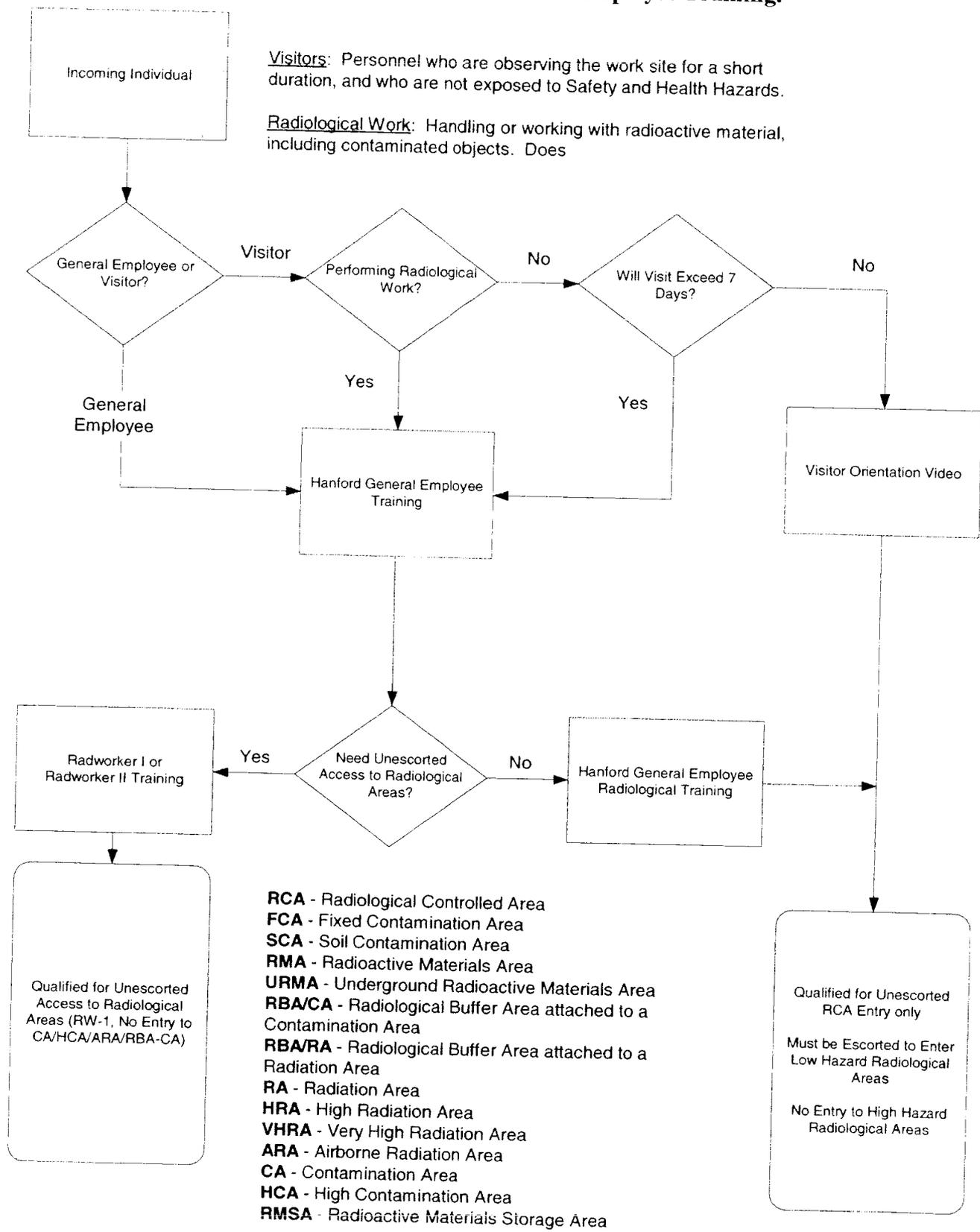
Required Minimum Documentation Available for CONTRACTOR/OWNER Review

- Safety Bulletin Board. (4.1.07.A) [2-54]

4.1.08 GENERAL EMPLOYEE TRAINING

- A. SUBCONTRACTOR general employees and visitors are required to attend General Employee Radiological Training prior to unescorted entry into Radiologically Controlled Areas. SUBCONTRACTOR visitors whose length of visit will be 7 days or longer, and all permanent SUBCONTRACTOR employees shall attend WCH Hanford General Employee Training (HGET) or HGET equivalency prior to performing work on the Hanford Site. HGET is required for all of the aforesaid persons regardless of whether they will be working in zones of radiological contamination/radiation or not. Such training is conducted by CONTRACTOR and averages four hours in duration. SUBCONTRACTOR employees requiring access into Radiologically Controlled Areas of the Hanford Site as a minimum, require General Employee Radiological Training (GERT). GERT is approximately two (2) hours in length, and is given as part of HGET training. Refer to HGET. The SUBCONTRACTOR is responsible for all labor costs for employees receiving training. The SUBCONTRACTOR shall contact the CONTRACTOR one week in advance to schedule training. HGET equivalency must be approved by the WCH Training Manager.
- B. Review Section 4.3 of this exhibit, SH-4.3.01, "General" for radiological work conducted under CERCLA and SH-4.3.08, "Training" for associated training requirements.
- C. The SUBCONTRACTOR is responsible for scheduling, tuition, and labor costs of any specialized training required to perform the work under the contract (e.g., see Form G-04).

Figure 1. Hanford General Employee Training.



Visitors: Personnel who are observing the work site for a short duration, and who are not exposed to Safety and Health Hazards.

Radiological Work: Handling or working with radioactive material, including contaminated objects. Does

- RCA** - Radiological Controlled Area
- FCA** - Fixed Contamination Area
- SCA** - Soil Contamination Area
- RMA** - Radioactive Materials Area
- URMA** - Underground Radioactive Materials Area
- RB/CA** - Radiological Buffer Area attached to a Contamination Area
- RBA/RA** - Radiological Buffer Area attached to a Radiation Area
- RA** - Radiation Area
- HRA** - High Radiation Area
- VHRA** - Very High Radiation Area
- ARA** - Airborne Radiation Area
- CA** - Contamination Area
- HCA** - High Contamination Area
- RMSA** - Radioactive Materials Storage Area

4.1.09 FIRE PROTECTION-GENERAL

- A. Within 30 days after subcontract award and before commencing Work at the Jobsite the SUBCONTRACTOR shall establish and maintain a written Safety and Health Program that includes a Fire Protection/Prevention Program (if applicable) established in accordance with SH-4.1.02, (and SH-4.3.01, if applicable), and specifies procedures used to implement the Fire Protection/Prevention Program. The Fire Protection/Prevention Program will be compliant with 29 CFR 1910.39 and as a minimum include:
1. A list of all major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;
 2. Procedures to control accumulations of flammable and combustible waste materials;
 3. Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials;
 4. The name or job title of employees responsible for maintaining equipment to prevent or control sources of ignitions or fires; and
 5. The name or job title of employees responsible for the control of fuel source hazards.
 6. The program plan will be submitted to the CONTRACTOR for acceptance in accordance with Special Condition titled "Fire Prevention" and addresses the elements of SH-4.2.04 FIRE PROTECTION - FIELD.
- B. National Fire Protection Association (NFPA) Codes and Standards and contract-specific fire protection requirements identified by the CONTRACTOR Fire Protection Engineer (FPE) in the appropriate section of this subcontract document shall be followed for the applicable work activities [10 CFR 851.23]. Where no other fire protection requirements are identified, the SUBCONTRACTOR shall follow the applicable sections of NFPA 1, "Uniform Fire Code" and any codes or standards referenced therein. Any references in NFPA 1 to a building code or NFPA 5000 shall be replaced with the International Building Code (IBC). The FPE is the final authority for questions and interpretations regarding fire protection requirements.
- C. The Hanford Fire Department shall be immediately notified of all fires (see SH-4.1.06, "Emergency Reporting" above). Immediately following that notification, the CONTRACTOR shall be notified.
- D. Work areas shall be kept free from accumulations of unnecessary flammable and combustible materials, including vegetation.
- E. Flammable liquid storage cabinets shall be Underwriter Laboratory (UL) listed and Factory Mutual (FM) approved and shall not be modified or damaged.
- F. Flammable and combustible wastes (i.e., oily rags, containers with residue, absorbents, etc.) shall be removed daily from the work place to an approved storage container.

G. No unauthorized fires shall be permitted. Hot work activities shall be performed in accordance with SH-4.2.04 FIRE PROTECTION-FIELD.

Required Subcontractor Submittals (See Exhibit I)

- Written program and procedure for Fire Protection/Prevention.(maybe included as part of SH-4.1.02, Safety and Health Program submittal) (4.1.09.A) [2-02d]

SH-4.2 CONSTRUCTION SAFETY & HEALTH REQUIREMENTS

This section establishes specific requirements for SUBCONTRACTORS doing work on construction projects.

4.2.01 GENERAL

- A. SUBCONTRACTORS shall establish and maintain a written Worker Safety and Health Program Plan that includes a Construction and Industrial Safety Program established in accordance with SH-4.1.02, (and SH-4.3.01, if applicable) and specifies procedures used to implement the Construction and Industrial Safety Program.
- B. The SUBCONTRACTOR shall identify proposed key personnel, e.g., the superintendent and persons authorized to assume the superintendent's role during his or her absence, and other personnel to be assigned safety and health responsibilities, their qualifications and their respective duties. The superintendent or other duly designated representative shall be present on the Jobsite at all times during performance of this contract until the work is completed and accepted by the CONTRACTOR [10 CFR 851, Appendix A].
- C. The SUBCONTRACTOR safety representative shall make daily visits to the field activities and foster the zero accident philosophy with a proactive approach. The SUBCONTRACTOR safety representative shall interface with the CONTRACTOR safety representative to continually improve the Jobsite safety culture.
- D. The SUBCONTRACTOR'S designee shall have full and complete responsibility for compliance with regulatory and contractual safety and health requirements. The presence of dedicated CONTRACTOR project safety and health personnel shall not relieve the SUBCONTRACTOR designee of that responsibility.
- E. Joint SUBCONTRACTOR/CONTRACTOR walkdown of the Jobsite shall be performed in conjunction with the pre-construction briefing to identify hazards inherent to the site work operation(s) and the surrounding environment [10 CFR 851.21].
- F. The SUBCONTRACTOR shall ensure that each employee receives worker protection training and that each employee entering the Jobsite has, through experience, training and, where required, certification, the skills and knowledge necessary to safely perform his or her assigned tasks [10 CFR 851.25]. New hire orientation is not inclusive of all training that may be required.
- G. Prior to start of work, the SUBCONTRACTOR shall conduct a safety inspection of electrical tools and mechanical equipment (including cranes) to be brought to the Hanford Site. Deficiencies shall be corrected prior to arrival at the Jobsite. Documented evidence of inspection shall be maintained on the Jobsite for CONTRACTOR review.
- H. General Site Work Rules: SUBCONTRACTOR employees, lower tier SUBCONTRACTORS, visitors and vendors working at, or visiting the Jobsite shall, as a minimum, possess and wear a hard hat, safety glasses (or prescription safety glasses with side shields), footwear that is ASTM F2413-05/ANSI Z41 compliant, long pants, and shirts with sleeves, a minimum of 4 inches in length, at all times while at the Jobsite. Prescribed general (minimum) and specific personal protective equipment (PPE) shall be worn at all times unless in an "exception area" approved by the CONTRACTOR. The SUBCONTRACTOR shall enforce the General Site Work Rules as

specified in this section. Deviations from this requirement will require approval from the CONTRACTOR.

- I. The SUBCONTRACTOR shall develop a scaffold tagging system compatible with the WCH three-tag system. WCH uses a red tag to indicate scaffolds under construction or demolition, yellow to indicate scaffolds that are complete but have hazards associated with them, and green to indicate scaffolds erected to a complete, safe standard. The SUBCONTRACTOR may duplicate the WCH system.

Required Subcontractor Submittals (See Exhibit I)

- Written program and procedure for Construction and Industrial Safety Program.(maybe included as part of SH-4.1.02, Safety and Health Program submittal) (4.1.01.A) [2-02e]
- List of Key Supervisory and Safety & Health personnel. (4.2.01.B) [2-08]

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- Joint walkdown of Job Site hazards assessment (4.2.01.E) [2-55]
- Training commensurate with job requirements and scope of work. (4.2.01.F) [2-56]
- Electrical tools and mechanical equipment (including cranes) inspections. (4.2.01.G) [2-57]

4.2.02 HAZARD ANALYSIS

- A. Job-specific hazard analyses (JHA) shall be jointly developed by the CONTRACTOR and SUBCONTRACTOR in conjunction with the development of work packages and/or procedures in accordance with Exhibit K or other SUBCONTRACTOR documents that direct implementation of Integrated Work Control processes [10 CFR 851.21, 10 CFR 851.22].
- B. The SUBCONTRACTOR shall assess worker exposure to chemical, physical, biological, or ergonomic hazards through appropriate workplace monitoring (including personal, area, wipe, and bulk sampling); biological monitoring; and observation [10 CFR 851, Appendix A]. The SUBCONTRACTOR shall ensure that the proper and fully functioning instrumentation is maintained on site at all times to monitor the above range of hazards. Personnel operating the instruments shall be trained and qualified to do so and shall be fully capable of interpreting results. Monitoring results shall be promptly documented [10 CFR 851.26]. Documentation shall describe the tasks and locations where monitoring occurred, identify workers monitored or represented by the monitoring, and identify the sampling methods and duration, control measures in place during monitoring (including the use of PPE), and any other factors that may have affected sampling results. This monitoring shall occur throughout the subcontract performance period and shall adjust in frequency and type as appropriate to monitor changing waste streams created by the project. Industrial hygiene monitoring data shall be collected in relation to the scope of work.
- C. Workers shall be informed of foreseeable hazards and the required protective measures described within the approved hazard analysis prior to commencement of work on the affected construction operation.

Required Subcontractor Submittals (See Exhibit I)

- Job Hazards Analysis (if not included within work package). (4.2.02.A) [2-09]

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- Training commensurate with job requirements and scope of work. (4.2.02.B) [2-56]
- Documentation of exposure assessments, monitoring and sampling strategies and results. (4.2.02.B) [2-58]

4.2.03 INSPECTIONS AND HAZARD ABATEMENT

- A. During periods when work is in progress, the SUBCONTRACTOR shall have a designated representative on site at all times that is knowledgeable of the hazards that are present and has full authority to act on behalf of the SUBCONTRACTOR. When personnel are designated to be competent in a specialized area (e.g., scaffolding, excavations, fall protection, confined space inspections, etc.) the SUBCONTRACTOR must show by documentation that the designated person meets the requirements of their assigned duties by training and experience.
- B. The CONTRACTOR and SUBCONTRACTOR will jointly conduct safety and health inspections of the Jobsite on at least a weekly basis. The date of these inspections, hazards and instances of noncompliance, and corrective actions taken shall be documented in both the CONTRACTOR'S and SUBCONTRACTOR'S inspection records. If a more frequent inspection schedule (such as daily) is required by a specific regulatory or industry standard the SUBCONTRACTOR will be required to perform and document these inspections as per the applicable standard.
- C. If immediate corrective action(s) are not possible or the hazard falls outside of project work scope, the SUBCONTRACTOR shall immediately notify affected workers, post appropriate warning signs, implement interim control measures, and notify the CONTRACTOR of actions taken to protect employees and secure CONTRACTOR approval of the measures taken.
- D. When a condition is identified that poses danger of serious injury or impairment of health, work will be stopped immediately and personnel moved to a safe location. In the event of such danger, any person is authorized to stop work.

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- Required documentation for personnel identified as being competent and having specialized credentials. (4.2.03.A) [2-59]
- Weekly and periodic inspection documentation to be maintained at Jobsite. (4.2.03.B) [2-60]

4.2.04 FIRE PROTECTION-FIELD

- Clause not applicable.

**4.2.05 CONTROL OF HAZARDOUS ENERGY AND MATERIALS
(LOCKOUT/TAGOUT)**

- Clause not applicable.

4.2.06 HOISTING AND RIGGING

- Clause not applicable.

4.2.07 MEETINGS

A. The SUBCONTRACTOR shall conduct safety meetings with all workers at least weekly and when changes in work, work methods, or work environment introduce new hazards; minutes and records of attendance shall be kept. Safety meetings shall address:

1. Safety and health concerns related to the work activities and the Jobsite.
2. Accidents/incidents occurring at the Jobsite.
3. Results of Jobsite safety and health inspections, including the results of the CONTRACTOR and/or DOE inspections.
4. Lessons Learned by the SUBCONTRACTOR on similar work activities.
5. The SUBCONTRACTOR shall participate in monthly safety meetings established by the CONTRACTOR.
6. The SUBCONTRACTOR shall support the local safety improvement team (LSIT) meetings as required by the CONTRACTOR.

B. The SUBCONTRACTOR shall conduct daily plan-of-the-day (POD) meetings for field operations. POD meetings will include members of the CONTRACTOR'S support staff involved in work directly or indirectly affected by the SUBCONTRACTOR'S work.

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- Documentation of weekly safety and daily POD meetings to be maintained at the Jobsite. (4.2.07.B) [2-68]

4.2.08 ELECTRICAL SAFETY PRACTICES

- Clause not applicable.

4.2.09 EXCAVATIONS

- Clause not applicable.

4.2.10 TASK SAFETY AWARENESS (TSA) PROGRAM

- Clause not applicable.

4.2.11 INDUSTRIAL HYGIENE

- Clause not applicable.

4.2.12 FALL PROTECTION

- Clause not applicable.

4.2.13 TEMPERTURE EXTREMES

- Clause not applicable.

SH-4.3 HAZARDOUS WASTE & RADIOLOGICAL REQUIREMENTS

4.3.01 GENERAL

- Clause not applicable.

4.3.02 SITE-SPECIFIC HEALTH AND SAFETY PLAN

- Clause not applicable.

4.3.03 RADIOLOGICAL PROTECTION

- Clause not applicable.

4.3.04 DOSIMETRY (SEE FIGURE 2 – ISSUE OF CONTRACTOR – THERMO-LUMINESCENT DOSIMETER (TLD))

- Clause not applicable.

4.3.05 PERSONAL PROTECTIVE EQUIPMENT

- Clause not applicable.

Figure 2. Issue of Contractor TLD.

Figure not applicable - deleted.

4.3.06 RESPIRATORY PROTECTION

- Clause not applicable.

4.3.07 MEDICAL SURVEILLANCE

- Clause not applicable.

4.3.08 TRAINING

- Clause not applicable.

Figure 3. Hazardous Waste Worker and Rad Worker Training Matrix.

Figure not applicable - deleted

4.3.09 EMPLOYEE JOB TASK ANALYSIS (EJTA)

- A. The SUBCONTRACTOR is responsible for identifying potential exposures that their employees, and the employees of their lower tier subcontractors, will be exposed to while performing any work under this contract. Form G-04, "Training and Medical Surveillance" may be helpful in assessing potential exposures and completing the CONTRACTOR-supplied Employee Job Task Analysis (EJTA) form.
- B. The SUBCONTRACTOR shall ensure that its employees and those of any lower tiered subcontractor are medically qualified to perform work associated with any potential exposures that have been identified.
- C. The SUBCONTRACTOR shall complete an "Employee Job Task Analysis" (EJTA) form for each employee and each lower tier subcontract employee identified by the SUBCONTRACTOR and if the individual will be on site for a duration of more than 14 days. Copies of the completed EJTA forms shall be submitted to the CONTRACTOR'S Occupational Health Program Coordinator.

NOTE: The CONTRACTOR'S Occupational Health Program Coordinator will only be responsible for maintaining the most current version of the EJTA for each SUBCONTRACTOR employee once submitted by the SUBCONTRACTOR. The SUBCONTRACTOR will be responsible for maintenance of Original and Archival copies of the EJTA.

- D. The EJTA form and instructions for completion are available from the CONTRACTOR'S Project Safety Representative or the CONTRACTOR'S Occupational Health Program Coordinator.

- E. The CONTRACTOR shall provide all occupational medical requirements including physical examinations and recordkeeping as specified through the Hanford Site Occupational Medicine Provider. All time spent by SUBCONTRACTOR'S employees and transportation costs for medical examinations shall be at the expense of the SUBCONTRACTOR.
- F. The SUBCONTRACTOR shall revise the EJTA for current employees annually or when an employees essential job functions, physical job requirements, or medical qualifications are altered as a result of job transfer, change in job requirements, or change in the hazards encountered. The revised EJTA shall be submitted to the Occupational Health Program Coordinator through the CONTRACTOR'S Personnel Notification Form (PNF).
- G. SUBCONTRACTOR shall submit a template EJTA for CONTRACTOR review and acceptance for each job type/craft for each work location and unique work environment. The approved EJTA template will be used for individuals performing work in that work environment and processed through the PNF to the CONTRACTOR'S Occupational Health Program Coordinator.

Required Subcontractor Submittals (see Exhibit I)

- A template EJTA for each job type/craft for each work location, unique work environment and job description. (4.3.09.J) [2-18]

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- Form G-04, "Training And Medical Surveillance" (4.3.09.B) [2-56]
- Completed EJTA for each employee at risk of potential exposure. (4.3.09.A, 4.3.09.C) [2-82]

SH-5.0 SUBMITTALS and AVAILABLE DOCUMENTATION

Pursuant to the requirements of this Section, and the instructions provided in Exhibit I the following documentation is required to be submitted; available on/at the Hanford (job site or central work location.); or available from the SUBCONTRACTOR upon request in a timely manner.

NOTE: If the item has been grayed out the submittals and/or available documentation is not required by the CONTRACTOR to be submitted and/or maintained by the SUBCONTRACTOR based upon the contracted scope of work. It does not remove SUBCONTRACTOR documentation obligations that may be imposed by other regulatory or authorizing agencies.

5.1 SUBMITTALS

The following items must be submitted by the SUBCONTRACTOR.

Exhibit G Subcontractor Submittal Requirements Summary

Submittal Schedule	Submittal Type Required	Distribution Designation
F Prior to Fabrication	O Original	SC Submittal to Coordinator
S Prior to Shipment	P Prints/Photocopies	SA Subcontract Administrator
B Prior to Balance of Payment	T Transparencies	FM Field/Functional Manager
A Per S/C Schedule	M Microfilm	ES Engineering Services
M Prior to Mobilization	PH Photographs	ENV Environmental Monitoring & Management
W Prior to Commencing Work	FD Floppy Disk	PAS Project Activities & Services
U Prior to Use	S Sample	SH Safety & Health
X Prior to Purchase	(2) A number indicates quantity of copies	PR Procurement
Y Prior to Progress Payment for Each Specific Task	Q	EC Environmental Compliance
Z As Required		DM Data Management
14 Number Indicates Calendar Days After Award		QA Quality Assurance (Managed by QS and/or ARQP)
A		FP Fire Protection Engineer
		WM Waste Management
		RC Radiation Control
		AA

Notices

1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.

Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY		
			Schedule	(No.) and Type	Review	Info	
1-00 OPERATIONS SUPPORT							
1-05 NEC Inspection	Exhibit "G," 4.2.08	SC	Z	O	FM	SH ES	
1-06 Energized Electrical Work Procedure	Exhibit "G," 4.2.08	SC	Z	O	FM	SH ES	
1-08 Energized Electrical Work Permit	Exhibit "G," 4.2.08	SC	M Z	O,P	FM	RC SH ES	
1-09 Energized Systems As-Builts	Exhibit "G," 4.1.06	SC	U	P	FM	ES	
2-00 SAFETY & HEALTH							
2-01 ISMS Declaration (Form-01)	Exhibit "G," 4.1.01	SC	M	O	FM	SH	

Exhibit G Subcontractor Submittal Requirements Summary

Submittal Schedule F Prior to Fabrication S Prior to Shipment B Prior to Balance of Payment A Per S/C Schedule M Prior to Mobilization W Prior to Commencing Work U Prior to Use X Prior to Purchase Y Prior to Progress Payment for Each Specific Task Z As Required 14 Number Indicates Calendar Days After Award A _____	Submittal Type Required O Original P Prints/Photocopies T Transparencies M Microfilm PH Photographs FD Floppy Disk S Sample (2) A number indicates quantity of copies Q _____	Distribution Designation SC Submittal to Coordinator SA Subcontract Administrator FM Field/Functional Manager ES Engineering Services ENV Environmental Monitoring & Management PAS Project Activities & Services SH Safety & Health PR Procurement EC Environmental Compliance DM Data Management QA Quality Assurance (Managed by QS and/or ARQP) FP Fire Protection Engineer WM Waste Management RC Radiation Control AA _____
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Notices

1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.

Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY	
			Schedule	(No.) and Type	Send to/for	
					Review	Info
2-02 Subcontractor S&H Program	Exhibit "G," 4.1.02 Exhibit "G," 4.1.03 Exhibit "G," 4.1.04 Exhibit "G," 4.1.06 Exhibit "G," 4.1.09 Exhibit "G," 4.2.01 Exhibit "G," 4.2.04 Exhibit "G," 4.2.08 Exhibit "G," 4.2.11 Exhibit "G," 4.2.12 Exhibit "G," 4.3.01 Exhibit "G," 4.3.02 Exhibit "G," 4.3.06 Exhibit "G," 4.3.07	SC	30, W	O,P(3)	FM(2) SH(2)	RC(1) SH
<i>2-02a Hazard Communication Plan</i>	Exhibit "G," 4.1.03	SC	30, W	O,P(3)	FM(2) SH(2)	EC SH ES
<i>2-02b Explosive Safety Program</i>	Exhibit "G," 4.1.04	SC	30, W	O,P(3)	FM(2) SH(2)	EC SH ES
<i>2-02c Reporting Accident and Injury Program</i>	Exhibit "G," 4.1.06	SC	30, W	O,P	FM	SH
<i>2-02d Fire Protection/Prevention Program</i>	Exhibit "G," 4.1.09 Exhibit "G," 4.2.01	SC	30, W	O,P	FM FP	SH
<i>2-02e Construction and Industrial Safety Program</i>	Exhibit "G," 4.2.01	SC	30, W	O,P	FM FP	SH
<i>2-02f Electrical Safety Program</i>	Exhibit "G," 4.2.08	SC	30, W	O,P	FM ES	SH
<i>2-02g Industrial Hygiene Program</i>	Exhibit "G," 4.2.11	SC	30, W	O,P	FM SH	SH
<i>2-02h Chronic Beryllium Disease Prevention Program</i>	Exhibit "G," 4.2.11	SC	30, W	O,P	FM SH	SH
<i>2-02i Fall Protection Program</i>	Exhibit "G," 4.2.12	SC	30, W	O,P	FM SH	SH
<i>2-02j Respiratory Protection Plan</i>	Exhibit "G," 4.3.06	SC	30, W	O,P	FM RC	SH
<i>2-02k Occupational Health Program</i>	Exhibit "G," 4.3.07	SC	30, W	O,P	FM SH	SH
<i>2-02l Beryllium management plan</i>	Exhibit "G," 4.3.07	SC	30, W	O,P	FM SH	SH
2-03 Form G-06, "Subcontractor Worker Safety and Health Program Plan"	Exhibit "G," 4.1.02	SC	30, W	O,P(3)	FM(2) SH(2)	RC(1) SH
2-04 PSD-8, "Washington Closure Hanford 10CFR851 Compliance Matrix"	Exhibit "G," 4.1.02	SC	30, W	O,P(3)	FM(2) SH(2)	RC(1) SH
2-05 Emergency Response Orientation Verification	Exhibit "G," 4.1.05	SC	W	O	FM	SH

Exhibit G Subcontractor Submittal Requirements Summary

Submittal Schedule F Prior to Fabrication S Prior to Shipment B Prior to Balance of Payment A Per S/C Schedule M Prior to Mobilization W Prior to Commencing Work U Prior to Use X Prior to Purchase Y Prior to Progress Payment for Each Specific Task Z As Required 14 Number Indicates Calendar Days After Award A _____	Submittal Type Required O Original P Prints/Photocopies T Transparencies M Microfilm PH Photographs FD Floppy Disk S Sample (2) A number indicates quantity of copies Q _____	Distribution Designation SC Submittal to Coordinator SA Subcontract Administrator FM Field/Functional Manager ES Engineering Services ENV Environmental Monitoring & Management PAS Project Activities & Services SH Safety & Health PR Procurement EC Environmental Compliance DM Data Management QA Quality Assurance (Managed by QS and/or ARQP) FP Fire Protection Engineer WM Waste Management RC Radiation Control AA _____
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Notices

1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.

Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY	
			Schedule	(No.) and Type	Send to/for	
					Review	Info
2-06 Subcontractor Monthly Accident and Injury/Illness Report	Exhibit "G," 4.1.06	SC	Z	O	FM	SH
2-07 Accident/Incident Investigation Report W/in 24 hrs.	Exhibit "G," 4.1.06	SC	Z	O	FM	SH
2-08 List of Key supervisory and S&H personnel.	Exhibit "G," 4.1.02 Exhibit "G," 4.2.01	SC	W	O	FM	SH
2-09 Job Specific Hazards Analysis	Exhibit "G," 4.2.02 Exhibit "G," 4.3.02	SC	Z	O	FM	SH
2-10 Fire Protection - Field	Exhibit "G," 4.2.04	SC	W			
2-10a Hot Work Control Plan	Exhibit "G," 4.2.04	SC	W	O,P	FM FP	SH
2-10a PAI Designation	Exhibit "G," 4.2.04	SC	W	O,P	FM FP	SH
2-11 Hoisting and Rigging						
2-11a Plans for Medium Lift, Heavy Lift and Other lifts designated as Critical	Exhibit "G," 4.2.06	SC	M	O	FM	ES
2-11b Crane Operator Qualifications	Exhibit "G," 4.2.06	SC	M	O	FM	ES
2-11c Lift summaries for lifts performed by equipment other than cranes	Exhibit "G," 4.2.06	SC	M	O	FM	ES
2-12 - Deleted -						
2-13 Industrial Hygiene	Exhibit "G," 4.1.04 Exhibit "G," 4.2.11	SC	Z			
2-13a Subcontractor and Contractor IH Monitoring Data	Exhibit "G," 4.2.11	SC	monthly	O		SOMP
2-14 Site Specific Health & Safety Plan	Exhibit "G," 4.3.02	SC	M	O,P(3)	FM(2) SH(2)	RC ES
2-14a IH Equipment and Calibration Program	Exhibit "G," 4.2.11	SC	M	O,P	FM SH	RC ES
2-14b Analysis Hazards Assessments & PPE Requirements	Exhibit "G," 4.3.05	SC	Z	O	FM	SH
2-15 Decontamination Material Control Plan/Procedure	Exhibit "G," 4.3.01	FM	W	O	FM	EC SH RC
2-16 Request for authorization to possess Radioactive Material or Radiation Generation Instrumentation	Exhibit "G," 4.3.03	SC	W (7 working days prior)	P(2)	RC FM	EC SH RC
2-17 Non-RCCC Radiation Exposure Data (by individual)	Exhibit "G," 4.3.04	SC	W	P	RC	SH RC
2-18 Template Employee Job Task Analysis	Exhibit "G," 4.3.09	SC	W	P	FM	SOMP SH
2-18a Form G-04, Training and Medical Surveillance	Exhibit "G," 4.3.09	SC	W	P	FM	SOMP SH
2-19 Security Program	Exhibit "A," Security	SC	30	O	FM(1)	RC SH ES

Exhibit G Subcontractor Submittal Requirements Summary

Submittal Schedule

F	Prior to Fabrication
S	Prior to Shipment
B	Prior to Balance of Payment
A	Per SAC Schedule
M	Prior to Mobilization
W	Prior to Commencing Work
U	Prior to Use
X	Prior to Purchase
Y	Prior to Progress Payment for Each Specific Task
Z	As Required
14	Number Indicates Calendar Days After Award
A	_____

Submittal Type Required

O	Original
P	Prints/Photocopies
T	Transparencies
M	Microfilm
PH	Photographs
FD	Floppy Disk
S	Sample
(2)	A number indicates quantity of copies
Q	_____

Distribution Designation

SC	Submittal to Coordinator
SA	Subcontract Administrator
FM	Field/Functional Manager
ES	Engineering Services
ENV	Environmental Monitoring & Management
PAS	Project Activities & Services
SH	Safety & Health
PR	Procurement
EC	Environmental Compliance
DM	Data Management
QA	Quality Assurance (Managed by QS and/or ARQP)
FP	Fire Protection Engineer
WM	Waste Management
RC	Radiation Control
AA	_____

Notices

1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.

Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontracto r Send Submittal to	Submittal Codes		FOR WCH USE ONLY		
			Schedule	(No.) and Type	Send to/for		
					Review	Info	
2-20 Security Incidents	Exhibit "A." Security	SC	Z	O	FM		
2-21 - Deleted -							
2-22 Fall Protection							
2-22a WCH-TR-031- Qualified/Competent Person Qualification Form	Exhibit "G," 4.2.12	SC	Z	O, P	FM SH		ES
2-22b WCH-QSH-050 - Fall Hazard Protection Analysis	Exhibit "G," 4.2.12	SC	Z	O, P	FM SH		ES
2023 Temperature Extremes							
2-23a WBGT Monitoring Data	Exhibit "G," 4.2.13	SC	Z	O, P	FM SH		ES
2-23b Physiological Monitoring Data	Exhibit "G," 4.2.13	SC	Z	O, P	FM SH		ES
5-00 ENGINEERING							
5-08 Electrical Design	Exhibit "G," 4.2.08	SC	W	O	ES		FM

5.2 AVAILABLE DOCUMENTS

The following items must be available to the CONTRACTOR and maintained by the SUBCONTRACTOR.

Exhibit G Subcontractor Available Documentation Requirements Summary	
Item No / Document Title	Clause, * Specification, or Scope of Work Paragraph
2-50 SAFETY AND HEALTH	
2-51 List of Hazardous Materials and associated MSDS	Exhibit "G," 4.1.03
2-52 Written authorization to transport explosives	Exhibit "G," 4.1.04
2-53 First Aid/CPR Certifications	Exhibit "G," 4.1.05
2-54 Safety Bulletin Board	Exhibit "G," 4.1.07
2-55 Joint S&H walkdown of Job Site hazards assessment	Exhibit "G," 4.2.01
2-56 Training commensurate with job requirements and scope of work.	Exhibit "G," 4.2.01 Exhibit "G," 4.2.02 Exhibit "G," 4.2.08 Exhibit "G," 4.2.12 Exhibit "G," 4.3.02 Exhibit "G," 4.3.05 Exhibit "G," 4.3.08 Exhibit "G," 4.3.09
2-57 Electrical tools and mechanical equipment (including cranes) inspections	Exhibit "G," 4.2.01
2-58 Documentation of exposure assessments, monitoring, and sampling strategies and results.	Exhibit "G," 4.2.02
2-59 List of Competent Persons	Exhibit "G," 4.2.03 Exhibit "G," 4.2.08 Exhibit "G," 4.2.09 Exhibit "G," 4.3.02
2-60 Daily/Weekly/Periodic S&H Inspections	Exhibit "G," 4.2.03
2-61 Reference copies of: <ul style="list-style-type: none"> • OSHA "Fire Protection and Prevention" standard • NFPA-1 • NFPA-241 	Exhibit "G," 4.2.04
2-62 Hot Work Permits	Exhibit "G," 4.2.04
2-63 Fire Watch Training Records	Exhibit "G," 4.2.04
2-64 Fire Extinguish Inspection Tags	Exhibit "G," 4.2.04
2-65 Lockout/Tagout Training Records	Exhibit "G," 4.2.05
-Deleted-	
2-67 Inspection records for lifting equipment, rigging, slings and/or lifting hardware/devices	Exhibit "G," 4.2.06
2-68 Weekly Safety and Daily POD meetings	Exhibit "G," 4.2.07
2-69 Electrical Utility Site Visit Form	Exhibit "G," 4.2.08
2-70 Training records for Electrical Operators and Spotters	Exhibit "G," 4.2.08
2-71 Daily excavation inspections	Exhibit "G," 4.2.09
2-72 TSA Cards	Exhibit "G," 4.2.10
2-72 Radiation Generating Device operating procedure	Exhibit "G," 4.3.03
2-73 NSNRC Agreement/State License	Exhibit "G," 4.3.03
2-74 Documentation of training on radiation sources and/or radiation generating devices	Exhibit "G," 4.3.03
2-75 Written request for approval to establish/extend ACL	Exhibit "G," 4.3.04
2-76 Approved authorization to establish/extend the ACL	Exhibit "G," 4.3.04

**Exhibit G
Subcontractor Available Documentation
Requirements Summary**

Item No / Document Title	Clause, * Specification, or Scope of Work Paragraph
2-77 Respiratory Protection (Form G-04) <ul style="list-style-type: none"> • Written hazards assessment and justification for the respirator selection • Training documentation • Respirator medical Qualifications • Fit testing documentation 	Exhibit "G," 4.3.06
2-78 Medical qualifications and fitness to perform work (Form G-04)	Exhibit "G," 4.3.07
2-79 Scaffolding Safety Checklist and Daily Inspection Forms	Exhibit "G," 4.2.12
2-80 Ladder Use Permit	Exhibit "G," 4.2.12
2-81 Elevated Work Platform repair, inspection, and maintenance records	Exhibit "G," 4.2.12
2-82 Completed EJTA for each employee at risk of potential hazard exposure	Exhibit "G," 4.3.09
2-83 Fire Marshal Permit	Exhibit "G," 4.1.04
2-84 Excavation Permit	Exhibit "G," 4.2.09

SH-6.0 FORMS

NUMBER	TITLE	REQUIREMENTS / CLAUSE
G-01	INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS) MATRIX	SH-4.1.01
G-02	SUBCONTRACTOR'S MONTHLY ACCIDENT AND INJURY/ILLNESS REPORT	SH-4.1.06
G-03	ACCIDENT/INCIDENT INVESTIGATION REPORT	SH-4.1.06
G-04	TRAINING & MEDICAL SURVEILLANCE	SH-4.1.08 SH-4.3.02 SH-4.3.06 SH-4.3.07 SH-4.3.08 SH-4.3.09
G-05	TASK SAFETY AWARENESS CARD	SH-4.2.10
G-06	WCH SUBCONTRACTOR WORKER SAFETY AND HEALTH PROGRAM PLAN (EXCLUDING COMPLIANCE MATRIX)	SH-4.1.02

SH-7.0 ATTACHMENTS

PRO/DOC NUMBER	TITLE	REQUIREMENTS / CLAUSE
PROFORMA	SUBCONTRACTOR CONTROL OF HAZARDOUS ENERGY AND MATERIALS (LOCKOUT/TAGOUT)	SH-4.2.05
WCH-TR-031	Qualified/Competent Person Qualification Form	SH-4.2.12
WCH-QSH-027	Ladder Use Approval Form	
WCH-QSH-039	Scaffolding Inspection Form	
WCH-QSH-040	Scaffolding Safety Checklist	
WCH-QSH-050	Fall Hazard Protection Analysis	
WCH-SH-215	Heat Stress Monitoring	SH-4.2.13
WCH-SH-263	Industrial Hygiene Heart Rate Monitoring	
PSD-8	PSD-8, Washington Closure Hanford 10 CFR 851 Compliance Matrix	SH-4.1.02.A FORM G-06

FORM G-01

INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS) MATRIX

Contractor ISMS Requirement	Applicable SUBCONTRACTOR ES&H Program Section
<p>1. Management commitment and leadership. Subcontractor Management's commitment to achieving and sustaining Zero Accident Performance and Zero unpermitted discharges or releases with respect to the environment.</p>	
<p>2. Define Scope of Work. Subcontractor's process for translating the Subcontract scope of work into specific work activities (tasks)</p>	
<p>3. Hazards associated with scope of work. Subcontractor shall acknowledge the Integrated Work Control Program as the process to identify and analyze hazards associated with the scope of work.</p>	
<p>4. Develop and implement hazard control. Subcontractor shall acknowledge the Integrated Work Control Program as the process for identifying applicable standards and requirements in order to effectively control hazards associated with the scope of work.</p>	
<p>5. Define the process to implement standards and requirements. Subcontractor shall describe how work will be performed in accordance with identified standards and requirements.</p>	
<p>6. Identify the process for reviewing, addressing and communicating lessons learned. Subcontractor shall describe the process for reviewing, addressing and communicating lessons learned as part of their program implementation and flowdown requirements.</p>	IWCP
<p>7. Identify the process for worker feedback and continuous improvement. Subcontractor shall identify the process for collecting and managing the feedback information, identifying continuous improvement opportunities, implementing corrective actions, and assuring worker participation in continuous improvement opportunities.</p>	IWCP
<p>8. Approach for flowdown of ES&H requirements. Subcontractor shall identify the process to ensure that applicable ES&H requirements flow down to all employees and lower tier Subcontractors.</p>	
<p>9. Subcontractor selection (ES&H) process. Subcontractor shall identify the ES&H criteria they will use when selecting lower tier Subcontractors.</p>	
<p>10. Compliance, responsibility and accountability. Subcontractor shall define processes to ensure that line management is responsible and accountable for ES&H performance and compliance with all applicable regulatory and subcontract requirements.</p>	
<p>11. ES&H incentives. Subcontractor shall describe the process to measure ES&H performance and provide recognition for meeting and/or exceeding established goals.</p>	

FORM G-02

SUBCONTRACTOR'S MONTHLY ACCIDENT AND INJURY/ILLNESS REPORT

Form must be completed monthly and submitted to the Contractor on or before the third working day of the month.

Include employee's name (separate sheet) associated with injury/illness.

Company Name		Reporting Month	Date of Report
Project Name	Subcontract No.	No. of Employees	
	Month	Total for Year to Date	Total for Subcontract
Hours Worked			
No. of First Aid Cases			
No. of OSHA Recordable Cases			
No. of Lost Workday Cases			
Lost Workdays			
Restricted Cases			
Restricted Workdays			
Fatalities			

SUBTIER SUBCONTRACTOR

COMPLETE THIS TABLE FOR EACH SUBTIER SUBCONTRACTOR ON THE PROJECT
(Make copies as necessary for additional subtier Subcontractors)

Company Name		Reporting Month	Date of Report
Project Name	Subcontract No.	No. of Employees	
	Month	Total for Year to Date	Total for Subcontract
Hours Worked			
No. of First Aid Cases			
No. of OSHA Recordable Cases			
No. of Lost Workday Cases			
Lost Workdays			
Restricted Cases			
Restricted Workdays			
Fatalities			

Comments: _____

FORM G-03

ACCIDENT/INCIDENT INVESTIGATION REPORT

Subcontractor/Vendor Name:		Date Prepared:	
Project:	STR:	STR Phone:	
Employee Name:			
Address:			
Job Title:			
S.S./HID#:	Phone:	D.O.B.:	Age:
Length of time on current job:		Years of experience on job or equipment:	
Date & time of injury:		Date & time injury reported:	
Type of injury: (first aid, recordable, lost time etc.)			
Affected body part:			
Place of incident/injury: (i.e., area, place, building, etc.)			
Description of activity at the time of the incident/injury:			
Source of incident/injury: (i.e., tool, equipment, weather, etc.)			
No. of lost days if applicable:		No. of restricted days if applicable:	
Medical Provider:		Safety Representative:	
Corrective actions:			
Prepared by:		Phone No.	Cell No.

FORM G-04
TRAINING & MEDICAL SURVEILLANCE

Company Name: _____ Project Location: _____ Subcontract Number: _____

Address: _____ City: _____ State: _____ Zip code: _____

Employee Name: _____ SSN: _____ Hanford ID: _____
(Last, First, MI.)

This certifies that the employee named above has met the training and medical requirements listed below relevant to the work the employee will be performing at the project site. The Subcontractor shall place an "X" in the box before the training and medical requirements which are required for this employee and then provide the dates when the training and medical requirements have been completed.

Required?	TRAINING	Date Completed	Expiration Date
	Hazardous Waste Operations 24/40 hour Training (29 CFR 1926.65)		
	Hazardous Waste Operations 8-hour Refresher Training (")		
	Hazardous Waste Operations Supervisor Training (29 CFR 1926.65)		N/A
	Hazardous Waste Operations 1/3-day On-the-Job Training (")		N/A
	Respirator Training (29 CFR 1910.134)		
	Radiation Worker I Training/8 hr biennial Retraining (CFR 935.902)		
	Radiation Worker II Training/8 hr biennial Retraining (CFR 935.902)		
	Radiological Control Technician (10 CFR 835.903)		
	DOT Hazardous Material Training (49 CFR 172)		
	Asbestos Awareness Training (29 CFR 1926.1101)		
	Asbestos Worker Training (29 CFR 1926.1101)		
	Asbestos Supervisor Training (29 CFR 1926.1101)		
	Lead Awareness Training (29 CFR 1926.62)		
	Trenching/Excavation Competent Person Training (29 CFR 1926.650)		
	Confined Space Entry Training (29 CFR 1910.146)		
	Cardiopulmonary Resuscitation (CPR) Training		
	First Aid Training		
	(Hanford) General Employee Radiological Training (GERT)		
	Hanford General Employee Training (HGET)		
	Hearing Conservation Program (HCP) (29 CFR 1926.52)		
	Fall Protection (29 CFR 1926)		
Required per EJTA?	MEDICAL SURVEILLANCE	Date Completed	Expiration Date
	Hazardous Waste Worker (29 CFR 1926.65)		
	Respirator Fit Test (29 CFR 1910.134)		
	Respirator Medical Examination (29 CFR 1910.134)		
	Asbestos Worker (29 CFR 1926.1101)		
	Lead Screening/Medical Surveillance (29 CFR 1926.62)		
	HCP Audiogram		
	Are there any medical restrictions? (yes/no) If yes attach explanation.		

Verified by:
Company ES&H Rep _____
(Name-Typed or Printed) Signature Date

Approved by:
Company Officer _____
(Name-Typed or Printed) Signature Date

Misrepresentation on the above document may result in the worker being removed from the project site and may be grounds for termination of this Subcontract

FORM G-05 (EXAMPLE)

TASK SAFETY AWARENESS CARD

Form not applicable - Deleted

FORM G-06

**WCH SUBCONTRACTOR WORKER SAFETY AND HEALTH
PROGRAM PLAN (PSD-8, “WASHINGTON CLOSURE HANFORD 10 CFR 851
COMPLIANCE MATRIX” IS MAINTAINED ON THE PROCUREMENT WEB
PAGE)**

FORM G-06
WCH SUBCONTRACTOR WORKER
SAFETY AND HEALTH PROGRAM PLAN
(10 CFR 851)

For purposes of this subcontractor program plan, the term SUBCONTRACTOR means subcontractor and their lower-tier subcontractors.

G-06.1 INTRODUCTION

On February 9, 2006, the U.S. Department of Energy (DOE) published the final rule of Title 10, *Code of Federal Regulations*, Parts 850 and 851 (10 CFR 850 and 851), "Chronic Beryllium Disease Prevention Program and Worker Safety and Health Program." The final rule established a framework for a worker protection program that reduces or prevents occupational injuries, illnesses, and accidental losses by requiring DOE CONTRACTORS and their SUBCONTRACTOR(S) (including sub-tier subcontractors) to provide their employees' with safe and healthful workplaces. In addition, the program established procedures for investigating whether a requirement has been violated, for determining the nature and extent of such violation, and for imposing an appropriate remedy.

In accordance with the final rule, SUBCONTRACTOR(S) are required to:

- Provide a place of employment that is free from recognized hazards that are causing or have the potential to cause death or serious physical harm to workers; and
- Ensure that work is performed in accordance with all applicable requirements of 10 CFR 851 and the worker safety and health program for the workplace.

Per 10 CFR 851, SUBCONTRACTOR(S) are required to develop and implement a written worker safety and health program that describes how compliance is achieved with requirements. In addition, the rule requires SUBCONTRACTOR(S) to integrate regulatory requirements with other related site-specific worker protection activities and with the ISMS.

This appendix is issued to document the Washington Closure Hanford, LLC (WCH) Subcontractor Worker Safety and Health Program Plan. This program plan will be used by SUBCONTRACTOR(S) for tailoring the plan to their proposed work activities. Submittal of the program plan for SUBCONTRACTOR(S) would consist of completing the final two columns of the attached compliance matrix. Program plan submittals by SUBCONTRACTOR(S) will be required to be reviewed and accepted by WCH prior to mobilization.

Beginning in May 25, 2007, no work may be performed at a WCH facility unless an approved worker safety and health program is in place for the workplace. WCH encourages SUBCONTRACTOR(S) to submit required documentation as early as possible to ensure they are reviewed and accepted prior to May 25, 2007, or mobilization (as applicable).

The effective date of this WCH Subcontractor Worker Safety and Health Program Plan is May 25, 2007, or 90 days after approval by DOE, Richland Operations Office (DOE-RL) of the WCH final plan, whichever is earlier. Field implementation of the approved written program plan by a

SUBCONTRACTOR is required to be complete by May 25, 2007 or mobilization (if applicable). Prior to that date, existing safety and health programs for a SUBCONTRACTOR will be implemented as written in existing policies and procedures.

G-06.2 PURPOSE AND SCOPE

The purpose of this attachment is to document a SUBCONTRACTOR(S) Worker Safety and Health Program Plan and demonstrate integration of the program with the Integrated Safety Management System (ISMS). The scope of this program plan is applicable to all WCH SUBCONTRACTOR(S).

This program plan applies to any subcontractor at any tier, that has responsibilities for performing work at a DOE site in furtherance of a DOE mission. For purposes of the regulation, SUBCONTRACTOR(S) must have a subcontract to perform services, as opposed to merely providing supplies, in order to fall within the scope of 10 CFR 851. In addition, a SUBCONTRACTOR who employs personnel for staff augmentation will be required to comply with either the WCH Worker Safety and Health Program Plan or the program plan of the employing SUBCONTRACTOR. This program plan does not apply to vendors, delivery persons, and others who do not have service contracts with SUBCONTRACTOR(S). In addition, the program plan does not apply to radiological hazards to the extent they are regulated by 10 CFR Parts 820, 830, and 835. Every SUBCONTRACTOR will be required to comply with 10 CFR 851 and the flowdown of such requirements from WCH.

G-06.3 APPLICATION OF 10 CFR 851 CLOSURE FACILITY DEFINITION

The River Corridor Closure Contract (RCCC) is a cost-plus-incentive fee contract for the cleanup of the Hanford Site river corridor that includes safety and cost performance and schedule performance incentives. In accordance with the RCCC, WCH has direct control over the RCCC work scope, when it is performed, how the work is performed, and who will perform the work. Per 10 CFR 851, a closure facility is defined as a facility that is non-operational and is, or is expected to be, permanently closed and/or demolished, or title to which is expected to be transferred to another entity for reuse. All facilities listed in Contract No. DE-AC06-05RL14655, as contained within Section J, Attachment J-1, Table of River Corridor Closure Contract Workscope meet the definition of "closure facility" under 10 CFR 851 because they are managed as either a remedial action or field work site (p. C-4 of the RCCC). These facilities support characterization and remediation of past practice waste sites, technology development, application of innovative remediation technologies, N-Reactor deactivation, and decontamination and decommissioning activities. Exceptions include mobile offices procured after award of the contract that are expected to meet requirements of 10 CFR 851 for non-closure facilities. In addition, facilities associated with the Environmental Restoration Disposal Facility (ERDF) are also expected to meet requirements of 10 CFR 851 for non-closure facilities.

Hazard controls associated with buildings that are occupied for supporting remedial actions and field work sites are managed via administrative controls (such as posting and Safety and Health surveillances). Hazard controls identified for unoccupied buildings include administrative controls (see above for examples), access controls (such as locking of buildings and security North of the Wye Barricade), and implementation of the Integrated Work Control Process (IWCP). The IWCP is used to plan and implement field work for WCH managed facilities. The IWCP utilizes multi-disciplinary teamwork and worker involvement to support the identification and analysis of work site hazards, development of the work package, performance of work, and observational approach for newly

identified hazards. Also covered are administrative work package close-out activities. Work packages are developed and approved for release utilizing a graded approach based on risk and complexity of the work hazards and worker competence. A full description of the IWCP is contained in Section 5.0 of the ISMSD. Table G-06.1 contains a general list of identified closure facility hazards and associated controls. The list of facilities qualifying as "closure facilities" per 10 CFR 851 will be internally managed by WCH and updated on an annual basis to reflect buildings that transition into "closure."

Table G-06.1 General List of Identified Closure Facility Hazards and Associated Hazard Controls.

10 CFR 851 Functional Element	Type of Hazard	Hazard Controls
Industrial and Construction Safety	Structural Integrity	Posting, access control, Health and Safety surveillances, general worker/supervisor awareness through training, IWCP
	Unprotected floor and wall openings	Posting, access control, Health and Safety surveillances, general worker/supervisor awareness through training, IWCP
	Inadequate industrial stairs and walking surfaces	Posting, access control, Health and Safety surveillances, general worker/supervisor awareness through training
Pressure Safety	Overpressurization of storage tanks	Health and Safety surveillances, Engineering assessments, procedure compliance
Fire Protection	Fire hazards	Health and Safety surveillances, general worker/supervisor awareness, IWCP, procedure compliance

G-06.4 FLOWDOWN OF REQUIREMENTS TO SUBCONTRACTOR(S)

As a minimum, every SUBCONTRACTOR must meet the requirements of 10 CFR 851 as delineated in Attachment G-06. Every SUBCONTRACTOR is required to identify in the attached compliance matrix their procedures and specific sections of their procedures which implement requirements of 10 CFR 851. An example of procedure implementation for WCH's Worker Safety and Health Program Plan is included in the attached matrix.

G-06.5 ROLES AND RESPONSIBILITIES

As a minimum, every SUBCONTRACTOR must meet the requirements of 10 CFR 851 as delineated in the attached compliance matrix. Every SUBCONTRACTOR is required to identify in the attached matrix personnel or management responsible for roles and responsibilities related to their program. An example of roles and responsibilities in WCH's Worker Safety and Health Program Plan is presented below in italics.

The WCH Safety, Health and Quality (SH&Q) organization is responsible for development and maintenance of this program plan. SH&Q is responsible for program development, implementation, and oversight and for performing the actions associated with the Price-Anderson Amendments Act program as described in QA-1-1.8, "Identification, Tracking, and Reporting of Price-Anderson Amendments Act Noncompliance." WCH Projects are responsible for implementation of the overall worker safety and health program and appropriate integration into subcontracting and work planning activities.

G-06.6 SAFETY AND HEALTH PROGRAM FUNCTIONAL AREAS

As a minimum, every SUBCONTRACTOR must meet the requirements of 10 CFR 851 as delineated in the attached compliance matrix. Every SUBCONTRACTOR is required to identify in the attached matrix functional areas of the rule as relevant to their program plan related to their proposed work activity. Functional areas as defined by 10 CFR 851 and flowed down from WCH are described below.

G-06.6.1 Safety and Health Program Management

WCH is committed to developing and maintaining a culture based on an "injury-free" workplace philosophy, under which all accidents are preventable and occupational injuries and illnesses are not acceptable. WCH places the highest value on the welfare of the worker, instilling a sense of ownership for the program, and embraces excellence in all aspects of performance. A SUBCONTRACTOR is required to demonstrate the following through their Worker Safety and Health Program Plan:

- Integration of safety and health considerations into business planning and decision making processes; including project research, development, planning, design, construction, and demolition;
- Establishment of safety performance indicators, and conducting trend analyses to identify opportunities for continuous improvement (information is provided to WCH who maintains responsibility for overall reporting of performance indicators and trend analyses); and
- Holding management and supervision responsible and accountable for procedure compliance.

General safety and health program requirements (as found in Exhibit G) address organizational and program roles and responsibilities, access controls for facilities from a safety and health perspective, general safety and health rules for WCH, and the Lessons Learned program for continuous improvement.

G-06.6.2 Construction and Industrial Safety

The WCH construction and industrial safety program establishes and implements those standards and requirements that ensure compliance with codes and requirements as defined in 10 CFR 851. A SUBCONTRACTOR is required to demonstrate the following through their Worker Safety and Health Program Plan:

- Project design and plans are reviewed to ensure that adequate safeguards are in place to ensure compliance;

- Hazards are addressed when selecting or purchasing equipment, products, or services;
- Work plans, hazards analyses, and pre-job activities identify and address the hazard associated with the site and/or work to be performed;
- An overall chemical management system is in place that governs the safe acquisition, storage, use, and disposal of chemicals;
- Routine safety and health inspections and/or self-assessments are conducted and the results are documented;
- Site and facility personnel are informed of potential safety and health hazards that may be encountered during performance of work;
- Investigations are conducted to establish the cause(s) of incidents and events that resulted or could have resulted in injuries, death, or significant property loss and the identify methods to prevent recurrence; and
- Analyses of accidents and injury data are performed to evaluate performance, identify trends, identify potential problem areas, and develop lessons learned (information is provided to WCH who maintains responsibility for overall reporting of performance indicators, trend analyses, and Lessons Learned – see Exhibit G for additional interface requirements).

Specific hazards addressed through implementation of the construction and industrial safety program for a SUBCONTRACTOR must include the following:

- Hazard communication;
- Excavations;
- Fall protection;
- Portable ladders;
- Confined spaces;
- Safety showers and eyewashes;
- Machine guards;
- Clean-up and housekeeping;
- Scaffolding;
- Forklift trucks;
- General deactivation and demolition;
- Elevating work platforms;
- Office safety; and
- Non-ionizing radiation sources.

G-06.6.3 Fire Protection

The WCH fire protection program (FPP) establishes and implements standards and requirements necessary to ensure facilities and projects are provided an adequate level of fire protection that will meet legal and contractual commitments. Identification, interpretation, and implementation of codes and requirements are key elements of the WCH FPP. A SUBCONTRACTOR is required to demonstrate the following through their Worker Safety and Health Program Plan:

- Review and approve design documents, work packages, procedures, specifications, analyses; and
- Provide technical support for implementation of Project and field activities.

WCH will have responsibility for interfacing with Security and the Hanford Fire Department to ensure integration on security and other onsite fire protection activities. Appraisals and fire protection facility assessments for the FPP are required to be conducted in accordance with the frequencies and category areas identified in 10 CFR 851 and contractor requirements document (CRD) 440.1A, and 420.1B (Attachment 2) and CRD O 420.1B (Supplement Rev. 4).

Per Contract No. DE-AC06-05RL14655, Attachment J-13, WCH is required to use the Hanford Site Fire Department and Emergency Preparedness services when responding to an emergency or for fire protection services. All such needed interfaces, with the exception of fires, by the SUBCONTRACTOR(S) are required to be coordinated through WCH and their Subcontract Technical Representative (STR) prior to performing work relevant to this functional area.

G-06.6.4 Firearms Safety

The WCH firearms safety program establishes and implements requirements necessary to ensure firearms are used safely and in accordance with 10 CFR 851. Approval of firearms used by a SUBCONTRACTOR other than Animal Control Services will require written approval from WCH Security. Employees that are approved for firearms use must possess a valid property pass from WCH Security and have current training in firearms safety. Personnel are required to attend and successfully complete annual firearms training, ensure fitness for duty by avoiding the use of judgment-altering substances, and wear personal protective equipment as the situation dictates; eye and ear protection are minimum requirements. Personnel who carry firearms are required to formally inspect their firearms and ammunition annually. In addition, WCH Security is required to conduct an annual assessment of the firearms program. Because WCH conducts limited work activities (animal control services) application of 10 CFR 851 requirements have been tailored to obtaining certification for maintenance, transportation, and storage of firearms and ammunition. All such needed interfaces by the SUBCONTRACTOR(S) are required to be coordinated through WCH and the STR prior to performing work relevant to this functional area.

G-06.6.5 Explosives Safety

The WCH explosives safety program establishes information and requirements needed to ensure effective management and oversight of transportation, storage, use of explosives and discovery of unexploded ordinance (UXO) by WCH and SUBCONTRACTORS. A SUBCONTRACTOR is required to interface with WCH in defining and implementing responsibilities associated with the following:

- Interfacing with other entities such as DOE-RL and Energy Northwest;
- General safety requirements;
- General transportation and vehicle requirements;
- Response to abnormal conditions;
- Storage of explosives and blasting agents;
- Storage magazine facilities;
- Storage magazine operations;
- Loading of explosives;

- Blasting requirements;
- Inventory control; and
- Records.

All such needed interfaces by the SUBCONTRACTOR(S) are required to be coordinated through WCH and the STR prior to performing work relevant to this functional area.

G-06.6.6 Pressure Safety

The WCH pressure safety program establishes and implements requirements for:

1. Surveillance and maintenance of existing pressurized system vessels and piping; and
2. Testing and procuring, storing, and using compressed gas cylinders, air compressors/compressed air, and pneumatic testing.

All activities are required to meet the requirements of 10 CFR 851 and be executed in accordance with the applicable codes and standards identified in the governing procedures. A SUBCONTRACTOR is required to demonstrate the following through their Worker Safety and Health Program Plan (as applicable to the proposed scope of work):

- Surveillance, maintenance, testing and certification (as applicable) of active pressure vessels and associated equipment and piping;
- General air compressor and compressed gas cylinder safety requirements;
- Use, safe handling, and storage requirements for compressed gas cylinders;
- Pneumatic testing with compressed air;
- Responsibility for monitoring safety procedures associated with compressed air and pneumatic testing;
- Specific testing requirements for pneumatic tests; and
- Management of manifold-type cylinders.

G-06.6.7 Electrical Safety

The WCH electrical safety program establishes and implements requirements necessary to be compliant with 10 CFR 851 and the *Standard for Electrical Safety in the Workplace* (NFPA 70E). The electrical safety program applies to all electrical and electronic work activities associated with operations managed by WCH. The program does not apply to the following: (1) electrical utilities work on transmission, transformation, and metering equipment, and (2) work performed on or near energized parts that operate at less than 50 volts. A SUBCONTRACTOR is required to demonstrate the following through their Worker Safety and Health Program Plan (as applicable to the proposed scope of work and as defined in Exhibit G):

- General electrical safety;
- Control of hazardous energy and materials (through compliance to the contractor lock out/tag out procedure);
- Access control to exposed live parts;
- Voltage-rated tools;
- Using electrical test equipment;

- Ground-fault protection for personnel;
- Ground-fault circuit interrupters;
- Assured equipment grounding conductor program;
- Flexible cords and cables;
- Excavations/subsurface penetration, drilling into walls, floors, or outdoor slabs;
- Resetting tripped protective devices;
- Performing work affecting electrical utilities; and
- Training (provided by the contractor).

G-06.6.8 Industrial Hygiene

The WCH industrial hygiene (IH) program focuses on the protection of the health of workers by minimizing exposure to physical, chemical, and biological hazards. This is accomplished through identifying, analyzing, controlling, and monitoring IH hazards during work planning activities and implementation.

Industrial hygienists provide oversight, technical support and direction, exposure monitoring for chemical, biological, and physical agent hazards, staff and subcontractor training, and communications necessary for IH safety awareness. A SUBCONTRACTOR is required to demonstrate the following through their Worker Safety and Health Program Plan (as applicable to the proposed scope of work):

- General and specific IH standards including asbestos, lead, beryllium, cadmium, and bloodborne pathogens;
- Hazards recognition and control;
- Exposure monitoring;
- Hazard related training; and
- Records management of general area and personal exposure monitoring.

G-06.6.9 Occupational Medicine

The WCH occupational medicine program establishes and implements requirements necessary to be compliant with 10 CFR 851 and other standards. Program procedures address identification of roles and responsibilities, maintaining a healthy work force, promoting a healthful work environment, and establishing worker protection requirements, including the development and maintenance of the employee job task analysis (EJTA). Additionally, program requirements are established for ensuring employees receive the appropriate medical attention during an on-the-job injury/illness.

Per Contract No. DE-AC06-05RL14655, H.8 WCH is required to use the Hanford Site Occupational Medical Contractor (HSOMC) for all occupational medical services, including occupational medical records. WCH will manage all occupational medical requirements including physical examinations as specified through the Hanford Site Occupational Medicine Provider. SUBCONTRACTORS shall contact their STR to coordinate access to site medical services. All time spent by SUBCONTRACTOR'S employees and transportation costs for medical examinations shall be at the expense of the SUBCONTRACTOR.

G-06.6.10 Biological Safety

There are no biological etiologic agents associated with the River Corridor Closure Project. Should biological etiological agents be found or identified, SUBCONTRACTORS will stop work and contact their STR.

G-06.6.11 Motor Vehicle and Aviation Safety

The WCH motor vehicle and aviation safety programs establish and implement requirements necessary to be compliant with 10 CFR 851 and other standards. A SUBCONTRACTOR is required to demonstrate the following through their Worker Safety and Health Program Plan (as applicable to the proposed scope of work):

- General vehicle and aviation safety requirements;
- Hanford supplemental requirements related to aviation;
- New/initial/existing flight service contracts;
- Aviation point of contact;
- Personnel qualifications;
- Aviation safety program elements;
- Pre-and post-flight requirements;
- Off-road driving on the Hanford Site;
- Vehicle maintenance; and
- Personal travel safety.

Per Contract No. DE-AC06-05RL14655, Attachment J-13, DOE contracts through other Hanford Prime Contractors for maintenance and enforcement of infrastructure security and motor vehicle/traffic laws.

PSD-8, "Washington Closure Hanford 10 CFR 851 Compliance Matrix" demonstrates WCH compliance to 10 CFR 851 and is provided space to subcontractor to provide information on how they address applicable criteria based upon their work scope.

NOTE: All non-applicable Requirements/Criteria for the scope of work have been 'grayed out' in the Compliance matrix.

**Form G-06 Washington Closure Hanford Subcontractor Worker Safety and Health Program Plan
10 CFR 851 Compliance Matrix**

WCH Subcontractor Company
Name* : _____

WCH Subcontract
No(s)* : _____

WCH Subtier Subcontractor Company
Name: _____

I certify that to the best of my knowledge the information provided in the attached compliance matrix is accurate and complete.

ES&H Manager (or authorized
person): _____
Position of Authority: _____

Submit the completed compliance matrix to the following address:

Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-11
Richland, Washington 99354
Attention: WCH/Submittal Coordinator in R&DC

* These blocks are required to be completed. Document is required to be submitted hardcopy.

Stop Work

DOE-0343

Revision 2

Effective Date: January 18, 2010

Stop Work

1.0 PURPOSE

The purpose of this procedure is to ensure that all employees are given the responsibility and authority to stop work when employees believe that a situation exists that places them, their coworker(s), contracted personnel, or the public at risk or in danger; could adversely affect the safe operation or cause damage to the facility; or result in a release of radiological or chemical effluents to the environment above regulatory requirements or approvals; and provides a method to resolve the issue (see Appendix A). Maintaining a diligent questioning attitude is vital to safe execution of work-scope and is a cornerstone to effective Conduct of Operations and Integrated Safety Management.

Portions of this procedure implement requirements of the Worker Safety and Health Program Plan for compliance to 10 *Code of Federal Regulations* (CFR) 851, “Worker Safety and Health Program” and are bracketed in the text. This procedure also implements the “Stop Work and Shutdown Authorization” clause included in section H of each of DOE’s Prime Contracts (see Appendix B).

This procedure extends the authority to stop work to situations where an employee believes there is a need to clarify work instructions; or to propose additional controls.

2.0 SCOPE

This procedure is applicable to all contractors and subcontract personnel working at the Hanford site.

3.0 RESPONSIBILITIES

3.1 Employees

In supporting safe execution of work, all personnel, have the following responsibilities [10 CFR 851.A1]:

- The responsibility and authority to stop work or decline to perform an assigned task without fear of reprisal, to discuss and resolve work and safety concerns. The Stop Work may include discussions with co-workers, supervision, or safety representative to resolve work related issues, address potential unsafe conditions, clarify work instructions, propose additional controls, etc.
- The responsibility and authority to initiate a Stop Work IMMEDIATELY, without fear of reprisal, when the employee believes a situation exists which places himself/herself, a coworker(s), or the environment in danger or at risk.
- The responsibility to report any activity or condition the employee believes is unsafe or for which they have initiated a Stop Work. Notification should be made to the affected worker(s) and to the supervisor or their supervisor’s designee at the location where the activity or condition exists.

Stop Work

- The responsibility to notify their supervisor if a raised Stop Work issue has not been resolved to their satisfaction through established channels prior to the resumption of work. Alternatively, contact the employer's Employee Concerns Program or the DOE Employee Concerns Program.
- Employee can contact their safety representative or union safety representative with a concern or to initiate a stop work, if the employee prefers to remain anonymous.

3.2 Management/Supervisor/Person in Charge (PIC)/ Field Work Supervisor (FWS)

Management and supervision are committed to promptly resolve issues resulting from an employee-raised Stop Work [10 CFR 851.20]. Management (e.g., Directors, Managers, Supervisors) responsibilities are to:

- Resolve any issues that have resulted in an individual stopping a specific task(s) or activity.
- Provide feedback to individual/s and the affected work group who have exercised their Stop Work responsibility on the resolution of their concern prior to resuming work. If the employee that issued a stop work is not available due to reasons such as vacation, PTB, PTO, shift change, or training then the supervisor provides the feedback to the safety representative and union safety representative, prior to resuming work.
- Notify the employer's Safety Representative and the Union Safety Representative, when bargaining unit personnel are affected, if a raised stop work issue has not been resolved.
- Notify the DOE Facility Representative if the Contractor's Stop Work action meets the Stop Work Criteria defined in Appendix B.
- Ensure no actions are taken as reprisal or retribution against individuals who raise safety concerns or stop an activity they believe is unsafe.
- If a stop work is not brought up by a bargaining unit employee, but does impact bargaining unit personnel, then also notify the union safety representative.

3.3 Safety Representatives(s) and Union Safety Representative(s) are Responsible to:

- Assist employees, supervision and management in the resolution of safety issues and concerns.
- Immediately contact management and work to resolve issues when an employee has called a situation to their attention that has not been resolved.
- Discuss resolution with employees involved in a work stoppage where resolution was completed after their shift or when they were unavailable, or where he/she acted as their representative in reaching resolution.
- Work as the agent of an employee that prefers to remain anonymous to work directly in the resolution of the stop work.

Stop Work

4.0 IMPLEMENTATION

Effective Immediately.

5.0 PROCESS

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Employee	1.	Stop work if an activity or condition is believed to be unsafe, such as: <ul style="list-style-type: none">a. A situation exists that places them, their coworker(s), contracted personnel, or the public at risk or in danger;b. A situation could adversely affect the safe operation or cause damage to the facility; orc. A situation could result in a release of radiological or chemical effluents to the environment above regulatory requirements or approvals.d. To clarify work instructions or to propose additional controls
Manager/ Supervisor/PIC/ FWS	2.	Ensure the work/activity is in, or placed in a safe condition and <u>immediately</u> notify supervision/management and affected workers when you stop work or decline to perform an activity.
	3.	Resolve any issues that have resulted in an employee stopping work or an activity. Involve individuals who initiated the Stop Work or their appropriate safety representatives if the individual is not available, in reaching mutual agreement on the resolution or proposed actions necessary to return to work. Be sure any necessary corrective or compensatory actions are taken before resuming an activity and are documented* in accordance with Contractor procedures (logbook or other established method of reporting/tracking/communicating safety issues and corrective action management). Notify senior management, and the DOE Facility Representative if the Stop Work meets the Stop Work Criteria defined in Contract Section H "Stop-Work and Shutdown Authorization" (Appendix B), Report in accordance with established notification processes (e.g., occurrence reporting).

Stop Work

Actionee

Step

Action

4. If a Stop Work has not been resolved to the mutual agreement of manager and employee, then the stop work remains in place and the Supervisor/PIC/FWS will notify the appropriate company management, safety representative and union safety representative. Resolution of the stop work resides with the union safety representative and company management to resolve and/or propose actions necessary to return to work. Work may be resumed when union safety representation and management agree that the issue has been resolved. The objective is to reach resolution at the lowest levels of engagement.

Notify the DOE Facility Representative that a Stop Work has resulted in an unresolved issue.

***NOTE:** For resumption of radiological work, consult the Radiological Control Manual for additional approval requirement.

5.0 REFERENCES

Hanford Site Stop Work Policy

10 CFR 830, "Nuclear Safety Management," *Code of Federal Regulations*

10 CFR 851, "Worker Safety and Health Program," *Code of Federal Regulations*

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations**

DOE-STD-1098-2008, Department of Energy (DOE) Radiological Control Standard

Stop Work

Appendix A Stop Work Policy

Stop Work Responsibility: Every Hanford site employee, regardless of employer, has the responsibility and authority to stop work IMMEDIATELY, without fear of reprisal, when the employee believes:

1. Conditions exist that pose a danger to the health and safety of workers or the public; or
2. Conditions exist, that if allowed to continue, could adversely affect the safe operation of, or could cause serious damage to, a facility; or
3. Conditions exist, that if allowed to continue, could result in the release from the facility to the environment of radiological or chemical effluents that exceed applicable regulatory requirements or approvals.

Reporting Unsafe Conditions: Employees are expected to report any activity or condition which he/she believes is unsafe. Notification should be made to the affected worker(s) and then to the supervisor or designee at the location where the activity or condition exists. Following notification, resolution of the issue resides with the responsible supervisor.

Right to a Safe Workplace: Any employee who reasonably believes that an activity or condition is unsafe is expected to stop or refuse work without fear of reprisal by management or coworkers and is entitled to have the safety concern addressed prior to participating in the work.

Stop Work Resolution: If you have a "stop work" issue that has not been resolved through established channels, immediately contact your employer's Safety Representative or your Union Safety Representative. Alternatively, you may contact the employer's Employee Concerns Program or the DOE Employee Concerns Program.

Stop Work

Appendix B DOE Facility Representative (FR) Notification Requirements

If any of the following criteria is met or notification of facility management is required for the issue, the Supervisor/Manager will notify the FR on a 24 hour real time basis.

Stop Work Criteria:

1. Conditions exist that pose an imminent danger to the health and safety of workers or the public; or
2. Conditions exist, that if allowed to continue, could adversely affect the safe operation of, or could cause serious damage to, the facility; or
3. Conditions exist, that if allowed to continue, could result in the release from the facility to the environment of radiological or chemical effluents that exceed applicable regulatory requirements or approvals.

The following definitions shall be used in conjunction with the above stated criteria:

Imminent Danger: Any condition or practice such that a hazard exists that could reasonably be expected to cause death, serious physical harm, or other serious hazard to employees, unless immediate actions are taken to mitigate the effects of the hazard and/or remove employees from the hazard.

Adversely Affects Safe Operation of Facility or Serious Facility Damage: A condition, situation, or activity that if not terminated or mitigated could reasonably be expected to result in: nuclear criticality; facility fire/explosion; major facility or equipment damage or loss; or, a facility evacuation response.

**SUPPLIER SUBMITTAL REQUIREMENTS SUMMARY (SSRS)
PREPARATION INSTRUCTIONS**

SSRS Number 0600X-SS-S0013
Rev. No. 0

SUBCONTRACTOR SUBMITTAL REQUIREMENTS SUMMARY

FOR

SUPER CELLS 9 AND 10 CONSTRUCTION QUALITY ASSURANCE (CQA)

AT

ENVIRONMENTAL RESTORATION AND DISPOSAL FACILITY (ERDF)

The following subcontractor submittal requirements (the full text of which is attached hereto) are made part hereof to fixed price-type subcontracts entered into in the furtherance of the performance of Contract No. DE-AC06-05RL14655 between Washington Closure Hanford and the U.S. Department of Energy.

<u>Clause Number</u>	<u>Title</u>	<u>Page Number</u>
1	Submittal Requirements	3
2	Submittal Recipients	3
3	Types of Submittals	4
4	Submittal Status and return by WCH	5
Attachment A	Administrative Subcontractor Submittal Requirements Summary	6

**EXHIBIT "I" – SUBCONTRACTOR SUBMITTAL REQUIREMENTS
SUMMARY COMPLETION INSTRUCTIONS**

SSRS Number 0600X-SS-S0013
Rev. No. 0

EXHIBIT "I"
SUBCONTRACTOR SUBMITTAL REQUIREMENTS SUMMARY FOR CONSTRUCTION SUBCONTRACT

CLAUSE 1 - SUBMITTAL REQUIREMENTS

Subcontractor shall furnish all submittals (such as drawings, data, catalog cuts, and samples) in accordance with the Subcontractor Submittal Requirements Summary (SSRS) and this clause.

All submittals prepared for this Subcontract shall show the following information in or near the title block:

- Hanford-RCCC
- WCH Subcontract Number

Submittal of several items together is acceptable. Each submittal shall have a copy of the SSRS form attached and the "Submittal Title" of the item being submitted shall be circled or highlighted.

WCH will determine if submittals received are complete and reserves the right to reject and require resubmittal of any submittal(s) that does not meet the requirements.

WCH also reserves the right to request any submittal not included on the SSRS form or any new submittal requirement.

CLAUSE 2 - SUBMITTAL RECIPIENTS

Submittals of all documents as identified on the SSRS shall be made directly to the individuals noted below.

- a) The Submittal Coordinator's (SC) address is:

Washington Closure Hanford
2620 Fermi
MSIN: H4-11
Richland, WA 99354
Attention: Hanford-RCCC/Submittal Coordinator

- b) The Subcontract Administrator's (SA) address is:

Washington Closure Hanford
2620 Fermi
MSIN: H4-17
Richland, WA 99354
Attention: **D. D. Looney**

- c) The Subcontract Technical Representative's (STR) address is:

Washington Closure Hanford
2620 Fermi
MSIN: T2-10
ERDF Super Cells 9 and 10 Construction Field Office, MO-622
Richland, WA 99354
Attention: **Subcontract Technical Representative**

**EXHIBIT "I" – SUBCONTRACTOR SUBMITTAL REQUIREMENTS
SUMMARY COMPLETION INSTRUCTIONS**

SSRS Number 0600X-SS-S0013
Rev. No. 0

CLAUSE 3 - TYPES OF SUBMITTALS

Documents

Each submittal shall be an unfolded, direct reading, first-generated copy. The minimum size of submittals shall be 8 1/2" x 11". Each submittal shall be of a sufficient quality to produce clearly legible/readable third-generation copies using electrostatic (Xerox-type) processes.

Submittals larger than 11" by 17" shall be electrostatic (Xerox-type) copies and shall be rolled and inserted into mailing tubes.

Drawing Requirements

All drawings and diagrams shall be prepared in accordance with the latest applicable American National Standard Institute Drafting Manual, ANSI-Y14 and WCH Specification 0000-X-SP-X0001, Subcontractor Prepared Design Drawings, latest revision.

"Typical," "standard," or "off-the-shelf" drawings will be acceptable only if they have all non-applicable sections either removed or noted on each drawing.

Magnetic Storage Media

1. Data submitted on magnetic storage media (e.g., CD ROM) shall be accompanied by a hard copy list of the media contents and a letter of transmittal, including the following:
 - Subcontract number
 - A description of contents per the Subcontract SSRS Form (e.g., 100-Area, CADD Design Files)
 - Number and type of items (CD's, etc.)
 - AutoCAD drawing CAD files must be named per guidance in WCH Specification 0000X-SP-X0001
 - Note if the submittal is a resubmittal
2. Storage media shall be CD ROM utilizing Windows XP or higher format.
3. Record documents submitted on storage media shall be accompanied by a matching hard copy documenting appropriate signatures.

Samples

Submittal of sample materials, such as bentonite, geomembrane, or geotextile swatches, etc., shall be of the size and type as noted in the technical specifications.

EXHIBIT "I" – SUBCONTRACTOR SUBMITTAL REQUIREMENTS SUMMARY COMPLETION INSTRUCTIONS

SSRS Number 0600X-SS-S0013
Rev. No. 0

CLAUSE 4 - SUBMITTAL STATUS AND RETURN BY WCH

A copy of submittal(s) requiring review will be returned by WCH with status (code) marked as follows using Supplier Document Status Stamp (see sample shown):

1. Work may proceed.
2. Submit final submittal. Work may proceed.
3. Revise and resubmit. Work may proceed subject to resolution of indicated comments.
4. Revise and resubmit. Work may not proceed.
5. Permission to proceed not required.

Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the subcontractor/supplier, and does not relieve subcontractor/supplier from full compliance with contractual obligations or release any "holds" placed on the contract.

Work shall not proceed until submittals requiring prior review (see SSRS) have been returned by WCH with a Code 1, 2, 3, or 5 notation. Subcontractor shall incorporate changes as required by comments on submittals and resubmit corrected submittals for review. Submittals that have been given a Code 1 notation by WCH shall not be changed without notification to WCH. If changes are required, affected submittals shall be resubmitted to WCH for review.

WASHINGTON CLOSURE HANFORD							Job No. 14655								
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP															
<input type="checkbox"/> 1. Work may proceed <input type="checkbox"/> 2. Revise and resubmit. Work may proceed prior to resubmission. <input type="checkbox"/> 3. Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. <input type="checkbox"/> 4. Revise and resubmit. Work may not proceed. <input type="checkbox"/> 5. Permission to proceed not required.															
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.															
	CIVIL/STRUCTURAL/ ARCHITECTURAL/ GEOTECHNICAL	ELECTRICAL	MECHANICAL	PROCESS/NUCLEAR	CADD	PROJECT REF.	ENVIRONMENTAL	WASTE MANAGEMENT	SAFETY	INDUSTRIAL HYGIENE	FIRE PROTECTION	QA	RADCON	FIELD ENGINEER	OTHER
CHECK REVIEW REQUIREMENT															
REVIEWED BY															

Project Engineer/STR _____

Date _____

DOCUMENT ID NUMBER

SC/P.O. No. _____

SSRS ITEM _____

SUBMITTAL _____

WCH-DE-032 (01/15/2007)

Exhibit "I" (Attachment A) Subcontractor Submittal Requirements Summary

Submittal Schedule

F	Prior to Fabrication
S	Prior to Shipment
B	Prior to Balance of Payment
A	Per S/C Schedule
M	Prior to Mobilization
W	Prior to Commencing Work
U	Prior to Use
X	Prior to Purchase
Y	Prior to Progress Payment for Each Specific Task
Z	As Required
14	No. Indicates Calendar Days After Award
A	_____

Submittal Type Required

O	Original
P	Prints/Photocopies
T	Transparencies
M	Microfilm
PH	Photographs
CD	Compact Disk
S	Sample
(2)	A number indicates quantity of copies
Q	_____

Distribution Designation

CC	CONOPS Coordinator
DC	Document Control
ENV	Environmental
EPL	Environmental Project Lead
ES	Engineering Services
FM	Field/Functional Manager
FP	Fire Protection Engineer
PC	Project Controls
PR	Procurement
PSS	Procurement Subcontract Specialist
QA	Quality Assurance
RC	Radiation Control
SA	Subcontract Administrator
SH	Safety & Health
SME	Subject Matter Expert
SOMP	Site Occupational Medical Provider
STR	Subcontract Technical Representative
WM	Waste Management

<u>Notices</u>							
1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.							
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.							
Contract Submittals							
Items to be Sent to Subcontract Administrator							
Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY		
			Schedule	(No.) and Type	Send to/for		
					Review	Info Copy	
1-00 FIELD SUPPORT							
1-01	Subcontract Interpretation	Exhibit "A," 2.0 Exhibit "A," 5.0	SA	Z	O		PR STR
1-02	Differing Site Conditions	Exhibit "A," GC-7.8	STR	Z	O		ES STR SA
1-03	Subcontract Key Personnel	Exhibit "B," SC-4.9	STR	Z	O		ES SA STR
1-04	Subcontract Milestones	Exhibit "B," SC-4.4	STR	Z	O		ES SA STR
1-05	Subcontractor Schedule	Exhibit "B," SC-4.5.1	STR	15	O		ES SA STR
1-06	Plant, Equipment and Facilities	Exhibit "A," GC-7.16	STR	W	O		SA ES STR
1-08	Work and Operations at Site Requiring Specific Approval	Exhibit "B," SC-6.2	-	--	--	--	--
	<i>1-08a Overtime Notice</i>	Exhibit "B," SC-6.2.2	STR	4hrs, W	O		STR
1-13	Notice of Provisional Acceptance	Exhibit "A," GC-8.6	SA	Z	O		ES STR
1-14	Notice of Final Acceptance	Exhibit "A," GC-8.6	SA	Z	O		ES STR

Exhibit "I" (Attachment A) Subcontractor Submittal Requirements Summary

2-00 SAFETY & HEALTH							
2-01 ISMS Declaration (Form-01)	Exhibit "G", 4.1.01	DC	M	O	SH	STR	
2-02 Subcontractor S&H Program	Exhibit "A," 7.6 Exhibit "G," 4.1.02 Exhibit "G," 4.1.03 Exhibit "G," 4.1.06 Exhibit "G," 4.1.09 Exhibit "G," 4.2.01	DC	30, W	O, P	STR SH	RC	
2-02a Hazard Communication Plan	Exhibit "B," SC-4.7.2 Exhibit "G," 4.1.03	DC	30, W	O, P	STR SH	EPL ES	
2-02c Reporting Accident and Injury Program	Exhibit "G," 4.1.06	DC	30, W	O, P	STR SH		
2-02d Fire Protection/Prevention Program	Exhibit "B," SC-4.8 Exhibit "G," 4.1.09 Exhibit "G," 4.2.01	DC	30, W	O, P	STR FP	SH	
2-02e Construction and Industrial Safety Program	Exhibit "G," 4.2.01	DC	30, W	O, (2)P	STR SH FP		
2-03 Form G-06, "Subcontractor Worker Safety and Health Program Plan"	Exhibit "G," 4.1.02	DC	30, W	O	SH	RC STR	
2-04 PSD-8, "Washington Closure Hanford 10CFR851 Compliance Matrix"	Exhibit "G," 4.1.02	DC	30, W	O	SH	RC STR	
2-05 Emergency Response Orientation Verification	Exhibit "G," 4.1.05	DC	W	O, P	STR SH		
2-06 Subcontractor Monthly Accident and Injury/Illness Report	Exhibit "G," 4.1.06	DC	Z	O, P	SH STR		
2-07 Accident/Incident Investigation Report W/in 24 hrs.	Exhibit "G," 4.1.06	STR	Z	O		SH STR	
2-08 List of Key supervisory and S&H personnel.	Exhibit "G," 4.2.01	DC	W	O, P	STR SH		
2-09 Job Specific Hazards Analysis	Exhibit "G," 4.2.02 Exhibit "G," 4.3.02	DC	Z	O, P	STR SH		
2-16 Request for authorization to possess Radioactive Material or Radiation Generation Instrumentation	Exhibit "G," 4.3.03 Exhibit "D", 3.6.1.1	DC	W (7 working days prior)	O, P	RC STR	EPL SH	
2-18 Template Employee Job Task Analysis	Exhibit "G," 4.3.09	DC	W	O, P	FM STR	SOMP SH	
2-18a Form G-04, Training and Medical Surveillance	Exhibit "G," 4.3.09	DC	W	O, P	FM STR	SOMP SH	
2-19 Security Program	Exhibit "A," 7.5.1.7	DC	30	O, P	FM STR	RC SH ES	
2-20 Security Incidents	Exhibit "A," 7.5	STR	Z	O		FM STR	
2-72 Radiation Generating Device Operating Procedures	Exhibit "G," 4.3.03 Exhibit "D", 3.6.1.1	DC	W (7 working days prior)	O, P	RC STR	EPL SH	
2-73 NSNRC Agreement/State License	Exhibit "G," 4.3.03 Exhibit "D", 3.6.1.1	DC	W (7 working days prior)	O, P	RC STR	EPL SH	
3-00 ENVIRONMENTAL/CHEMICAL/ WASTE MANAGEMENT							
3-01 SUBCONTRACTOR Environmental Compliance Plan	Exhibit "A," GC-7.9 Exhibit "J," 4.1.01	DC	W	O, P	EPL WM	STR	
3-10 Mobilization and Demobilization Hazardous Material Inventory	Exhibit "J," 4.2.01	DC	Z	O, P	EPL SH	STR	
3-11 Notification of or Quarterly Inventory Updates of Chemical Materials/Products Inventory	Exhibit "J," 4.2.01	DC	Z	O, P	EPL SH	STR	
3-12 Chemical Inventory Quantities of Toxic Chemicals used throughout the calendar year	Exhibit "J," 4.2.01	DC	Z	O	EPL	STR	

Exhibit "I" (Attachment A)
Subcontractor Submittal Requirements Summary

4-00 PROCUREMENT							
4-01	Defect under Warranty	Exhibit "A," GC-7.19	SA	Z	O		ES STR PR
4-02	Claim for Equitable Adjustment (Suspension)	Exhibit "A," GC-7.27	SA	Z	O		ES STR PR
4-03	Insurance Certificate	Exhibit "B," GC-7.33	SA	10	O		PR STR
4-04	Insurance Cancellation, Termination or Alteration	Exhibit "B," GC-7.33	SA	Z	O		PR STR
4-05	Amendment of Limits of Insurance	Exhibit "B," GC-7.33	SA	Z	O		PR STR
4-06	Authorized Representative	Exhibit "A," GC-8.1	SA	W	O		PR STR
4-07	Change Notices	Exhibit "A," GC-8.5	STR	Z	O		STR ES SA PR
4-08	Claim for Equitable Adjustment (Changes)	Exhibit "A," GC-8.5	SA	Z	O		ES STR PR
4-09	Backcharge Notice Approval	Exhibit "A," GC-9.4	SA	Z	O		ES STR PR
4-10	Proposal for Adjustment (Termination)	Exhibit "A," GC-9.8	SA	Z	O		ES STR PR
4-12	Purchase and Subcontract Agreements	Exhibit "A," GC-9.12	SA	Z	O		STR
4-13	Dispute Notification	Exhibit "A," GC-9.14	SA	Z	O		STR PR
4-14	Workplace Substance Abuse Program	Exhibit "A," GC-9.19.1	DC	30	O	SH	STR
4-15	SF1413 -- Davis Bacon Compliance (Statement of Acknowledgement)	Exhibit "A," GC-9.19	SA	Z	O		STR PR
4-16	Letter of Credit	Exhibit "B," SC-3.1	SA	10	O		STR PR
4-17	Performance and Payment Bonds	Exhibit "B," SC-3.2	SA	7	O		STR PR
4-18	Measurement and Schedule for Progress Payment	Exhibit "B," SC-3.3	STR	15	O		STR SA PC
4-19	Monthly Estimate of Work Complete	Exhibit "B," SC-3.3	STR	Y	O		SA PC(3)
4-20	Invoice for Monthly Progress Payment	Exhibit "B," SC-3.3	SA	Z	O		STR PC(3)
4-21	Bond for Lien	Exhibit "B," SC-3.3	SA	Z	O		STR PR
4-22	Expenditure Notification	Exhibit "B," SC-3.4	SA	Z	O		STR
4-23	75% of Subcontract	Exhibit "B," SC-3.4	SA	Z	O		STR
4-24	Progress Reports	Exhibit "B," SC-4.5.7	SA	Z	O		STR PR

Exhibit "I" (Attachment A)
Subcontractor Submittal Requirements Summary

4-25	85% of Total Amounts Allocated	Exhibit "B," SC-6.4	SA	Z	O		STR PR
4-26	Safety Incentive Pay	Exhibit "B," SC-6.8.3.3	STR	Z	O		STR SH PR
5-00 ENGINEERING							
5-01	Drawings, Data and Samples	--	--	--	--	--	--
	<i>5-01a Drawings</i>	Exhibit "B," SC-4.3.2.1	DC	14, W	O	ES	STR
	<i>5-01b Samples</i>	Exhibit "B," SC-4.3.2.2	DC	30, W	O	ES	STR
	<i>5-01c Data and Certificates</i>	Exhibit "B," SC-4.3.2.3	DC	30, W	O	ES	STR
5-09	Training Matrix	Exhibit "D", 3.8 CQAP, 3.0	DC	W (7 working days prior)	O, P	SH ES	STR
5-10	CQA Personnel Qualifications	CQAP, 3.0	DC	W (7 working days prior)	O	ES	STR
5-11	Off-Site Laboratory Qualifications	Exhibit "D", 2.4.4	DC	W (7 working days prior)	O	ES	QA STR
5-12	Geomembrane Manufacturer Plant Inspection Plan	CQAP, 4.6.1.1	DC	W (7 working days prior)	O	ES	STR
5-13	Geomembrane Conformance Testing	CQAP Section 4.6.1	DC	Z	O, P	ES QA	STR
5-14	Geotextile Conformance Testing	CQAP Section 4.7.2.3	DC	Z	O, P	ES QA	STR
5-15	Geocomposite Conformance Testing	CQAP Section 4.7.2.3	DC	Z	O, P	ES QA	STR
5-16	Daily Field Reports	CQAP, 5.1	STR	Z	O		STR ES
5-17	Testing Equipment Calibration Reports	CQAP, 5.1	DC	Z	P	QA	ES STR
5-18	Inspection Data Sheets	CQAP, 5.2	DC	Z	(2)P	ES QA	STR
5-19	Nonconformance Reporting	CQAP, 5.3	DC	Z	0, (2)P	QA STR ES	FM
5-20	Design Changes and Clarifications	CQAP, 5.4	STR	Z	O		FM STR ES
5-21	Progress Reports	CQAP, 5.5	STR	A	O		STR ES
5-22	CQA Surveys	Exhibit "D", 2.1.9.2	DC	Z	O	ES	QA STR
5-23	Admix Test Fill Report	Exhibit "D", 2.1.3	DC	A	O, P	ES QA	STR
5-24	Admix Liner Report	Exhibit "D", 2.1.3	DC	A	O, P	ES QA	STR
5-25	Secondary Geomembrane Liner Report	Exhibit "D", 2.1.3	DC	A	O, P	ES QA	STR
5-26	Secondary Leachate Collection System Report	Exhibit "D", 2.1.3	DC	A	O, P	ES QA	STR
5-27	Primary Geomembrane Liner Report	Exhibit "D", 2.1.3	DC	A	O, P	ES QA	STR
5-28	Primary Leachate Collection System Report	Exhibit "D", 2.1.3	DC	A	O, P	ES QA	STR
5-29	Leachate Tank Report	Exhibit "D", 2.1.3	DC	A	O, P	ES QA	STR

Exhibit "I" (Attachment A)
Subcontractor Submittal Requirements Summary

5-30	Cell 9 Final Certification Report	Exhibit "B", 4.4.1 Exhibit "D", 2.1.5 CQAP, 5.6	DC	Z	O, (6)P	ES QA	STR
5-31	Cell 10 Final Certification Report	Exhibit "B", 4.4.1 Exhibit "D", 2.1.5 CQAP, 5.6	DC	Z	O, (6)P	ES QA	STR
6-00	QUALITY ASSURANCE PROGRAM						
6-01	Quality Assurance Program	Exhibit "A," GC-7.30 Exhibit "D", 3.5	DC	Z	O	QA	STR
7-00	OPERATIONS PROGRAMS						
7-01	WCH-DE-023, CONOPS Subcontractor Applicability and Flow-down Worksheet	Exhibit "K", 4.1.01	DC	W	O	ES	CC STR
7-03	Potentially Distractive Written Material and Devices Procedure/Policy	Exhibit "B", SC-4.1 Exhibit "K", 4.1.02	DC	10, W	O	STR	ES
8-00	OTHER ADMINSTRATIVE SUBMITTALS						
	None						
9-00	OTHER TECHNICAL SUBMITTALS						
	None						

EXHIBIT J

REV. NO. 0

WASHINGTON CLOSURE HANFORD

**SUBCONTRACTOR
ENVIRONMENTAL AND WASTE MANAGEMENT
REQUIREMENTS**

R013213A00

0

REQUISITION/CONTRACT
NUMBER

REV. No.


Approval

11-9-09
Date

TABLE OF CONTENTS

EP-1.0 PURPOSE/SCOPE	3
EP-2.0 CODES, STANDARDS, LAWS AND REGULATIONS	3
EP-3.0 DEFINITIONS	4
EP-4.0 ENVIRONMENTAL AND WASTE MANAGEMENT REQUIREMENTS	4
EP-4.1 ENVIRONMENTAL REQUIREMENTS.....	5
4.1.01 ENVIRONMENTAL COMPLIANCE PLAN	5
4.1.02 ENVIRONMENTAL REQUIREMENTS	6
EP-4.2 CHEMICAL MANAGEMENT REQUIREMENTS	8
4.2.01 CHEMICAL MANAGEMENT REQUIREMENTS	8
EP-4.3 WASTE MANAGEMENT REQUIREMENTS.....	10
4.3.01 WASTE MANAGEMENT REQUIREMENTS	10
4.3.02 WASTE OBSERVER TRAINING	10
EP-4.4 HAZARDOUS MATERIAL/HAZARDOUS WASTE TRANSPORTATION REQUIREMENTS.....	11
4.4.01 HAZARDOUS MATERIAL/HAZARDOUS WASTE TRANSPORTATION REQUIREMENTS	11
EP-5.0 SUBMITTALS and AVAILABLE DOCUMENTS.....	12
EP-6.0 FORMS.....	14
EP-7.0 ATTACHMENTS.....	14

NOTE: All non-applicable Requirements are 'grayed out' in the Table of Contents, Forms and/or Submittal Lists.

SUBCONTRACTOR ENVIRONMENTAL AND WASTE MANAGEMENT REQUIREMENTS

EP-1.0 PURPOSE/SCOPE

This exhibit provides instruction to SUBCONTRACTORS in the areas of environmental, chemical, waste management, and hazardous material/hazardous waste transportation requirements. This exhibit does not relieve the SUBCONTRACTOR or its lower-tier Subcontractor(s) from recognizing and complying with applicable laws, regulations, permits requirements and conditions set forth in Exhibit A - General Conditions. The SUBCONTRACTOR shall flow down Exhibit J requirements to lower-tier Subcontractor(s).

EP-2.0 CODES, STANDARDS, LAWS AND REGULATIONS

- A. The following is a potential list of environmental statutes, regulations, and requirements that may be applicable to the Subcontractor's work (list is non-inclusive):
1. Ecology Publication WQ-R-95-56, Vehicle and Equipment Washwater Discharges
 2. Permit ST 4511 Permit, *State Waste Discharge Permit No. 4511*, Washington State Department of Ecology, February 16, 2005, Olympia, Washington
 3. DOE/RL-97-67, Rev. 5, *Pollution Prevention and Best Management Practices Plan for State Waste Discharge Permit ST 4511*
 4. The Sand and Gravel General Permit, Washington State Department of Ecology, January 5, 2005, Olympia, Washington
 5. 40 *Code of Federal Regulations (CFR)* 82, "Protection of Stratospheric Ozone"
 6. 40 CFR 355, "Emergency Planning and Notification"
 7. *Washington Administrative Code (WAC)* 246-272, "On-Site Sewage Systems"
 8. *Recommended Standards and Guidance for Performance Application, Design and Operation & Maintenance for Holding Tank Sewage Systems, approved by the Washington State Department of Health 12/31/98*
 9. Holding Tank Sewage system Memorandum of Understanding Between the United States Department of Energy, Richland Operations Office and the Washington state Department of Health (to be provided by the CONTRACTOR)
 10. 40 CFR 112, "Oil Pollution Prevention"
 11. Tier Two Emergency and Hazardous Chemical Inventory Report

12. Toxic Release Inventory Report
13. 40 CFR Parts 260 through 280, "Hazardous Waste"
14. *Resource Conservation and Recovery Act of 1976 (RCRA)*
15. WAC Chapter 173-303, "Dangerous Waste Regulations"
16. 49 CFR Parts 100 through 185, "Transportation"
17. DOT and Federal Motor Carrier Safety Regulations requirements contained in 49 CFR Parts 40, 382, 383, 387, 390-397, and 399
18. 40 CFR 122, National Pollutant Discharge Elimination System
19. 40 CFR 68, Chemical Accident Prevention Provisions
20. 40 CFR 372, Toxic Chemical Release Reporting
21. 40 CFR 63, Subpart ZZZZ
22. 40 CFR 60, Subpart IIII
23. 40 CFR 60 Subpart JJJJ

EP-3.0 DEFINITIONS

None.

EP-4.0 ENVIRONMENTAL AND WASTE MANAGEMENT REQUIREMENTS

In performance of work under this subcontract, the SUBCONTRACTOR shall comply with the following CONTRACTOR environmental and waste management requirements.

EP-4.1 ENVIRONMENTAL REQUIREMENTS

In performance of work under this subcontract, the SUBCONTRACTOR shall comply with the following CONTRACTOR environmental requirements.

4.1.01 ENVIRONMENTAL COMPLIANCE PLAN

- A. The SUBCONTRACTOR shall develop, maintain, and submit to the CONTRACTOR for review an Environmental Compliance Plan (ECPLAN) for conducting work in compliance with all applicable environmental laws, regulations, and permit requirements. The ECPLAN shall include, at a minimum, the following elements.
1. A description of the SUBCONTRACTOR environmental management system.
 2. Designation of a SUBCONTRACTOR environmental/waste management representative.
 3. Methods used in the field to ensure SUBCONTRACTOR compliance with applicable environmental laws, regulations, and permit requirements.
 4. Methods to address spill control and spill reporting including:
 - a. A spill prevention program that identifies areas and activities which may result in spills or releases to the environment.
 - b. Location and type of spill control and remediation material and equipment
 - c. A requirement to verbally communicate to the CONTRACTOR immediately all spills and releases to the environment.
 - d. A program to remove spilled material and contaminated environmental media as directed by the CONTRACTOR.
 5. Environmental requirements identified in EP-4.1.02 of this exhibit.
 6. Chemical management requirements identified in EP-4.2.01 of this exhibit.
 7. Waste management requirements identified in EP-4.3.01 of this exhibit.
 8. Hazardous Material/Hazardous Waste transportation requirements identified in EP-4.4.01 of this exhibit.
- B. A copy of the SUBCONTRACTOR'S ECPLAN shall be kept at the job site and all SUBCONTRACTOR employees shall be trained on the ECPLAN on an annual basis.
- C. The SUBCONTRACTOR shall immediately correct non-compliant conditions and provide notification to CONTRACTOR.
- D. The SUBCONTRACTOR shall ensure safe access for conducting inspections and shall provide information required in response to inspections by the CONTRACTOR, OWNER,

government agencies, and other agencies of jurisdiction (e.g., U.S. Environmental Protection Agency, Washington State Department of Ecology).

Required Subcontractor Submittals (see Exhibit I)

- SUBCONTRACTOR ECPLAN (4.1.01.A) [3-01]

Required Documentation – Available for CONTRACTOR Review

- SUBCONTRACTOR's records demonstrating employees have received annual training on the SUBCONTRACTOR's ECPLAN. (4.1.01.B) [3-51]

4.1.02 ENVIRONMENTAL REQUIREMENTS

A. Clause not Applicable

B. Clause not Applicable

C. Clause not Applicable

D. Clause not Applicable

E. Clause not Applicable

F. The SUBCONTRACTOR shall identify and implement methods to control liquid discharges, including designation of a SUBCONTRACTOR responsible individual, as required for discharges subject to Permit ST 4511. The SUBCONTRACTOR shall maintain a record showing the responsible individual has read ST 4511 Permit, State Waste Discharge Permit No. 4511, and DOE/RL-97-67, Rev. 5, Pollution Prevention and Best Management Practices Plan for State Waste Discharge Permit ST 4511. Requirements for miscellaneous discharges at the Hanford Site are identified in the following permits and documents:

1. Uncontaminated vehicle and equipment washing requirements are identified in Ecology Publication WQ-R-95-56, Vehicle and Equipment Washwater Discharges.
2. Permit ST 4511 Permit, State Waste Discharge Permit No. 4511, Washington State Department of Ecology, February 16, 2005, Olympia Washington
3. DOE/RL-97-67, Rev. 5, Pollution Prevention and Best Management Practices Plan for State Waste Discharge Permit ST 4511.
4. The Sand and Gravel General Permit, Washington State Department of Ecology, January 5, 2005, Olympia Washington.

G. Clause not Applicable

H. Clause not Applicable

- I. Clause not Applicable

EP-4.2 CHEMICAL MANAGEMENT REQUIREMENTS

In performance of work under this subcontract, the SUBCONTRACTOR shall comply with the following CONTRACTOR chemical management requirements.

4.2.01 CHEMICAL MANAGEMENT REQUIREMENTS

- A. The SUBCONTRACTOR'S ECPLAN shall include a chemical management program. The program shall address, at a minimum, the following elements:
1. Chemical tracking
 2. Chemical storage
 3. Material Safety Data Sheets (MSDSs)
 4. Chemical disposition
- B. The SUBCONTRACTOR shall submit to the CONTRACTOR an inventory of all hazardous chemical materials/products that are brought on site during the mobilization period (a hazardous chemical is any chemical that is a physical hazard or health hazard as defined by 29 CFR 1910.1200(c)). The initial inventory shall include the chemical material/product name, manufacturer, physical state, container type and size, intended use, storage location, date and quantity brought on site. The chemical custodian will ensure that all chemicals are recorded in the chemical inventory database. The SUBCONTRACTOR shall maintain manufacturers' MSDSs for all hazardous chemical materials/products in the SUBCONTRACTOR'S possession. At the end of the Subcontract, the SUBCONTRACTOR shall provide to the CONTRACTOR an inventory of the hazardous chemical materials/products being removed from the site.
- C. If the duration of the Subcontract performance period exceeds three (3) months, the SUBCONTRACTOR shall provide the CONTRACTOR with either (1) an updated quarterly inventory of or (2) notification that the Chemical Inventory Database has been updated for hazardous chemical materials/products stored on site each calendar quarter, or fraction thereof, for the entire performance period of the Subcontract. Quarterly reports are due (March 1, June 1, September 1, and December 1) regardless of the time of initial chemical inventory. The quarterly inventory shall include the type and quantity of hazardous chemical materials/products, changes to container type/size, and changes to storage locations.
- D. On an annual (calendar year) basis, or at the end of the Subcontract, the SUBCONTRACTOR shall provide the CONTRACTOR with the estimated quantity of chemical material/products used during the calendar year that contain a toxic constituent (as described in 40 CFR 372, "Toxic Chemical Release Reporting: Community Right-to-Know," otherwise known as the TRI Report).
- E. Chemicals shall be stored in accordance with OSHA and manufacturer's requirements.
- F. The SUBCONTRACTOR shall notify the CONTRACTOR at any time during the performance of the Subcontract of any increases in chemical materials/products being brought or stored on site that exceed the quantities necessary for normal operating practices.

Required Subcontractor Submittals (see Exhibit I)

- Mobilization and Demobilization Hazardous Materials Inventory. (4.2.01.B) [3-10]
- Notification of or quarterly inventory updates of hazardous chemical materials/products inventory (4.2.01.C) [3-11]
- Chemical inventory storage quantities and quantities of toxic chemicals used throughout the calendar year. (4.2.01.D) [3-12]

Required Minimum Documentation – Available for CONTRACTOR Review

- Updated hazardous chemical materials/products inventory, if new or increased quantities of chemical materials/products are brought on site. (4.2.01.A & F) [3-56]
- Manufacturers' MSDSs for all hazardous chemicals/material products in the SUBCONTRACTOR's possession. (4.2.01.B) [3-57]

EP-4.3 WASTE MANAGEMENT REQUIREMENTS

The SUBCONTRACTOR shall comply with the following CONTRACTOR waste management requirements. SUBCONTRACTOR waste management responsibilities identified in this Exhibit do not apply to CONTRACTOR waste.

4.3.01 WASTE MANAGEMENT REQUIREMENTS

Clause not Applicable

4.3.02 WASTE OBSERVER TRAINING

Clause not Applicable

**EP-4.4 HAZARDOUS MATERIAL/HAZARDOUS WASTE
TRANSPORTATION REQUIREMENTS**

The SUBCONTRACTOR shall comply with the following CONTRACTOR Hazardous Material/Hazardous Waste Transportation Requirements. This section applies to SUBCONTRACTOR scope that includes transportation of hazardous materials and/or hazardous wastes.

**4.4.01 HAZARDOUS MATERIAL/HAZARDOUS WASTE TRANSPORTATION
REQUIREMENTS**

Clause not Applicable

EP-5.0 SUBMITTALS AND AVAILABLE DOCUMENTS

Pursuant to the requirements of this Section, and the instructions provided in Exhibit I the following documentation is required to be submitted; available on/at the Hanford (job site or central work location.); or available from the SUBCONTRACTOR upon request in a timely manner.

NOTE: If the item has been grayed out the submittals and/or available documentation is not required by the CONTRACTOR to be submitted and/or maintained by the SUBCONTRACTOR based upon the contracted scope of work. It does not remove SUBCONTRACTOR documentation obligations that may be imposed by other regulatory or authorizing agencies.

5.1 SUBMITTALS

The following items must be submitted by the SUBCONTRACTOR.

Exhibit J Subcontractor Submittal Requirements Summary

Submittal Schedule F Prior to Fabrication S Prior to Shipment B Prior to Balance of Payment A Per S/C Schedule M Prior to Mobilization W Prior to Commencing Work U Prior to Use X Prior to Purchase Y Prior to Progress Payment for Each Specific Task Z As Required 14 Number Indicates Calendar Days After Award A _____	Submittal Type Required O Original P Prints/Photocopies T Transparencies M Microfilm PH Photographs FD Floppy Disk S Sample (2) A number indicates quantity of copies Q _____	Distribution Designation SC Submittal to Coordinator SA Subcontract Administrator FM Field/Functional Manager ES Engineering Services ENV Environmental Monitoring & Management PAS Project Activities & Services SH Safety & Health PR Procurement EC Environmental Compliance EPL DM Data Management QA Quality Assurance (Managed by QS and/or ARQP) FP Fire Protection Engineer WM Waste Management RC Radiation Control AA _____
--	---	---

<u>Notices</u>							
1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.							
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.							
Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY		
			Schedule	(No.) and Type	Review	Info	
Send to/for							
3-00 ENVIRONMENTAL/CHEMICAL/ WASTE MANAGEMENT							
3-01 SUBCONTRACTOR Environmental Compliance Plan	Exhibit "A," GC-27 Exhibit "J," 4.1.01.A	SC	W	O (3)P	EC WM FM		
3-02 Engineering Report (including design drawings), O&M Manual, and Certification of Completion for Septic Holding Tanks or Septic Systems (portable toilets are excluded)	Exhibit "J," 4.1.02.B	SC	U	O (3)P	EC ES FM		
3-03 Septic System Pumping Records and Inspection and Maintenance Logs	Exhibit "J," 4.1.02.B	SC	Z	O P	EC FM		
3-04 Written determination of 40 CFR 112 applicability	Exhibit "J," 4.1.02.C	SC	W	O P	EC		
3-05 Spill Prevention, Control, and Countermeasures Plan or oil management plan, as appropriate	Exhibit "J," 4.1.02.C	SC	W	O (3)P	EC ES FM		
3-06 Stormwater Pollution Prevention Plan	Exhibit "J," 4.1.02.D	SC	W	O (3)P	EC ES FM		

Exhibit J Subcontractor Submittal Requirements Summary

Submittal Schedule

F	Prior to Fabrication
S	Prior to Shipment
B	Prior to Balance of Payment
A	Per S/C Schedule
M	Prior to Mobilization
W	Prior to Commencing Work
U	Prior to Use
X	Prior to Purchase
Y	Prior to Progress Payment for Each Specific Task
Z	As Required
14	Number Indicates Calendar Days After Award
A	

Submittal Type Required

O	Original
P	Prints/Photocopies
T	Transparencies
M	Microfilm
PH	Photographs
FD	Floppy Disk
S	Sample
(2)	A number indicates quantity of copies
Q	

Distribution Designation

SC	Submittal to Coordinator
SA	Subcontract Administrator
FM	Field/Functional Manager
ES	Engineering Services
ENV	Environmental Monitoring & Management
PAS	Project Activities & Services
SH	Safety & Health
PR	Procurement
EC	Environmental Compliance/EPL
DM	Data Management
QA	Quality Assurance (Managed by QS and/or ARQP)
FP	Fire Protection Engineer
WM	Waste Management
RC	Radiation Control
AA	

Notices

1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.

Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY	
			Schedule	(No.) and Type	Review	Info
3-07	Certifications of efficiency testing of HEPA filters from manufacturers	SC	Z	O P	EC	
3-08	Make and model of HVU's and PTRAEU's	SC	Z	P	EC	
3-09	Monthly Air Quality Data Summary Record	SC	Z	O (2)P	EC FM	
3-10	Mobilization and Demobilization Hazardous Material Inventory	SC	Z	O (2)P	EC SH	
3-11	Notification of or Quarterly Inventory Updates of Chemical Materials/Products Inventory (if on site for more than three months)	SC	Z	O (2)P	EC SH	
3-12	Chemical Inventory Storage Quantities and Quantities of Toxic Chemicals used throughout the calendar year for inclusion in the annual Hanford Site Tier Two Emergency and Hazardous Chemical Inventory Report (Tier II), and the Toxic Release Inventory (TRI) Report	SC	Z	O P	EC	
3-13	Information necessary to complete an annual polychlorinated biphenyl (PCB) report (i.e., out-of-service date, waste stream, waste codes, net weight, container number, and shipment number) for any SUBCONTRACTOR generated waste that contains PCBs	SC	Z	O P	WM	
3-14	Information necessary to complete an annual Dangerous Waste Report (i.e., waste stream, waste codes, net weight, container number, and shipment number) for SUBCONTRACTOR-generated waste	SC	Z	O P	WM	
3-15	Quarterly summary of recycling activities	SC	Z	O (2)P	EC WM	
3-16	Formal written designations of all waste streams generated	SC	W	O P	WM	
3-17	Requests for approval for use of oils/greases	SC	W	O P	WM	
3-18	Transportation Security Plan	SC	W	O P	WM	
3-19	List of any stationary internal combustion engines and associated engine certification	SC	W	O P	EC	

5.2 AVAILABLE DOCUMENTS

The following items must be available to the CONTRACTOR and maintained by the SUBCONTRACTOR.

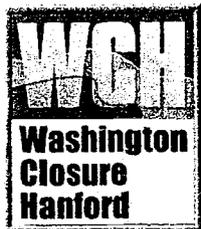
Exhibit J Subcontractor Available Documentation Requirements Summary	
Item No./ Document Title	Clause, * Specification, or Scope of Work Paragraph
3-50 ENVIRONMENTAL/CHEMICAL/ WASTE MANAGEMENT	
3-51 SUBCONTRACTOR's records demonstrating employees have received annual training on the SUBCONTRACTOR's ECPLAN.	Exhibit "J", 4.1.01.B
3-52 SUBCONTRACTOR training records and documentation of qualification for personnel	Exhibit "J", 4.1.02.A, Exhibit "J", 4.1.02.F, Exhibit "J", 4.1.02.H
3-53 Septic System Repair Records	Exhibit "J", 4.1.02.B
3-54 Records of use required by project-specific instructions	Exhibit "J", 4.1.02.E
3-55 SUBCONTRACTOR records of ODS equipment certifications	Exhibit "J", 4.1.02.H
3-56 Updated chemical materials/products inventory, if new or increased quantities of chemical materials/products are brought on site.	Exhibit "J", 4.2.01.A, Exhibit "J", 4.2.01.F
3-57 MSDSs for all chemicals/material products in the SUBCONTRACTOR's possession.	Exhibit "J", 4.2.01.B
3-58 Characterization, designation, inspection, and disposal records for SUBCONTRACTOR-generated waste.	Exhibit "J", 4.3.01.B
3-59 Listing of CONTRACTOR-approved oils/greases.	Exhibit "J", 4.3.01.G
3-60 Training records for SUBCONTRACTOR personnel.	Exhibit "J", 4.3.01.H Exhibit "J", 4.3.02.A
3-61 Current driver files.	Exhibit "J", 4.4.01.B.2
3-62 Controlled substances and alcohol use and testing records.	Exhibit "J", 4.4.01.B.3
3-63 Hazmat employee training records, medical qualifications, and certifications.	Exhibit "J", 4.4.01.B.4
3-64 Uniform Hazardous Waste Manifests.	Exhibit "J", 4.4.01.B.5

EP-6.0 FORMS

None

EP-7.0 ATTACHMENTS

None.



corrected ccN
151368

151352 *e*

June 29, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-010, INCORPORATE CHANGES TO
SUBCONTRACT EXHIBIT "K" (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-010, *Incorporate Changes to Subcontract Exhibit "K"*.

If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

A handwritten signature in black ink, appearing to read 'Charles V. Skiba', is written over a white background.

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachments: (1) Change Notice CN-010
(2) Exhibit "K", Subcontractor Operations Support Requirements, Rev. 1



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: Envirotech Engineers and Consultants, Inc.	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-11 Richland, WA 99354 Mr. Joe Voss, Project Manager	Effective Date: 06/23/10
	Subcontract No.: S013213A00
Change Notice No.: CN-010	Page 1 of 1

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:
INCORPORATE CHANGES TO SUBCONTRACT EXHIBIT "K".
 This change notice is American Recovery and Reinvestment Act of 2009 (ARRA)-funded.

Please incorporate Exhibit "K", Revision 1, Subcontractor Operations Support Requirements, into this Subcontract No. S012308A00 for ERDF Cells 9 & 10 Construction.

Envirotech is required to resubmit Exhibit "I", Submittal 07-01, WCH-DE-023, CONOPS Subcontractor Applicability and Flow-down Worksheet (CONOPS Matrix). An electronic copy of the revised CONOPS Matrix will be supplied to you in order for you to fill out the "Subcontractor Program / Procedure" column for this re-submittal where required.

The changes to Exhibit "K" are called out in the WCH Interoffice Memo (IOM) from Charles P. Ames, entitled Revision 02 to Exhibit "K", Subcontractor Operations Support Requirements, CCN 151473, dated June 10, 2010. Please disregard the Revision 02, which refers to the proforma document listed on Procurement and Property Management's Construction website. The Revision 1, specified above, applies to your specific Subcontract. This IOM failed to specifically refer to the addition of Section 4.1.03, Procedure Use and Adherence, Section 4.2.03, Training and Required Reading, plus Section 4.2.04, Required Minimum Documentation to Exhibit "K". The IOM, however, did discuss the changes brought about by these sections of the Exhibit "K" revision.

One other major change to Exhibit "K" was the revision of the WCH Integrated Work Control Program Procedure No. PAS-2-1.1, Integrated Work Control, Revision 7. This is in Section 7.0, ATTACHMENTS. Envirotech may be required to perform work associated with IWCP's generated by the SUBCONTRACTOR (TradeWind, LLC.) Therefore, Envirotech personnel performing work to an IWCP shall be trained, documented, and comply with the relevant IWCP and shall be responsible for performing work in concert with the SUBCONTRACTOR's IWCP documents.

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within _____ days
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM:		
William F. Melvin	Signature	6/28/10
Print Name		Date
STR:		
Charles V. Skiba	Signature	6/28/10
Print Name		Date
Procurement:		
Dana D. Looney	Signature	6/28/10
Print Name		Date
Initial:	<input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> N/A
Safety	QA	Eng.
	<input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> N/A
	Env.	RadCon



SUBCONTRACT CHANGE NOTICE

<input type="checkbox"/> Acknowledge and accept this change notice as specified.		
<input type="checkbox"/> Acknowledge and accept with the exception of the following:		
<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted
Signature:	Company: Envirotech Engineers and Consultants, Inc.	Date:

EXHIBIT K

REV. NO. 1

**WASHINGTON CLOSURE HANFORD
SUBCONTRACTOR
OPERATIONS SUPPORT REQUIREMENTS
ERDF Maintenance Facility Design/Construction**

S013213A00

1

**REQUISITION/CONTRACT
NUMBER**

REV. No.

Charles Ames / Ames
Approval

6/28/10
Date

TABLE OF CONTENTS

OP-1.0 PURPOSE/SCOPE	3
OP-2.0 CODES, STANDARDS, LAWS AND REGULATIONS	3
OP-3.0 DEFINITIONS	3
OP-4.0 OPERATIONS SUPPORT REQUIREMENTS	3
OP-4.1 CONDUCT OF OPERATIONS REQUIREMENTS	4
4.1.01 CONDUCT OF OPERATIONS	4
4.1.02 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	4
4.1.03 PROCEDURE USE AND ADHERENCE	4
4.1.04 REQUIRED MINIMUM DOCUMENTATION	5
OP-4.2 RESERVED	5
OP-5.0 SUBMITTALS AND AVAILABLE DOCUMENTS	7
OP-6.0 RESERVED	8
OP-7.0 ATTACHMENTS	8

WCH-DE-023, CONOPS Applicability and Flowdown Worksheet

FIGURES

None.

NOTE: All non-applicable Requirements are 'grayed out' in the Table of Contents, Forms and/or Submittal Lists.

SUBCONTRACTOR OPERATIONS SUPPORT REQUIREMENTS

OP-1.0 PURPOSE/SCOPE

This document is to be used to assist the SUBCONTRACTOR in understanding the operations support requirements of a specific project based on current conditions and/or operations in areas of the planned project. This document does not relieve the SUBCONTRACTOR and its lower-tier SUBCONTRACTORS' personnel of the requirement to plan for or provide a disciplined work control process for all work activities.

The "Operations Support Requirements" provide specific instruction to SUBCONTRACTOR in areas where there are CONTRACTOR requirements in addition to regulatory requirements, or where emphasis is needed in portions of the regulations.

Exhibit K incorporates Conduct of Operations and Work Control requirements applicable to performing work for WCH, and is hereby flowed down to SUBCONTRACTOR(s) and its lower-tier SUBCONTRACTORS.

OP-2.0 CODES, STANDARDS, LAWS and REGULATIONS

A. In addition to the SUBCONTRACTOR operations support requirements listed in this document, the SUBCONTRACTOR shall comply with the most recent edition (unless otherwise noted) of the following (list is non-inclusive):

1. CRD O 5480.19, Change 2 (Supplemented Rev 3), Conduct of Operations Requirements for DOE Facilities, U.S. Department of Energy, Washington, D.C., as documented on form WCH-DE-023 (attached).
2. Integrated Work Control Program (WCH PAS-2) including the following procedures:
 - PAS-2-1.1, Integrated Work Control
 - PAS-2-1.4, Job Hazard and What If Analysis

OP-3.0 DEFINITIONS

None.

OP-4.0 OPERATIONS SUPPORT REQUIREMENTS

In performance of work under this subcontract, the SUBCONTRACTOR shall comply with the following CONTRACTOR Conduct of Operations and Integrated Work Control Process (IWCP) requirements.

OP-4.1 CONDUCT OF OPERATIONS REQUIREMENTS

4.1.01 CONDUCT OF OPERATIONS

- A. The purpose of the Washington Closure Hanford (WCH) Conduct of Operations program is to ensure that facility activities are managed, organized, and conducted in a manner that results in a high level of performance and therefore contributes to safe and reliable operations. The elements of this program are fundamental to the manner in which activities are conducted to comply with Department of Energy (DOE) requirements. The SUBCONTRACTOR shall demonstrate that the mechanisms are in place to direct, monitor and verify implementation of the applicable portions of CRD O 5480.19, Conduct of Operations Requirements for DOE Facilities.
- B. The elements identified with the Conduct of Operations Requirements are specified on WCH-DE-023 "CONOPS Applicability and Flowdown Worksheet" as tailored for the contract to be awarded. Within ten (10) working days of Subcontract execution and prior to commencement of any Work, the SUBCONTRACTOR shall submit this tailored worksheet completed to include all applicable SUBCONTRACTOR procedures and processes for those requirements that are to be managed by the SUBCONTRACTOR for approval. See Attachment OP-A3 for a copy of the applicable WCH-DE-023 form.

4.1.02 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

- A. Within ten (10) working days of Subcontract execution and prior to commencement of any Work, the SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.
- B. Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the work.

4.1.03 PROCEDURE USE AND ADHERENCE

- A. Procedures/work instructions will be used in a thinking, compliant manner, using the instruction as written, with respect for the training and experience of the qualified user.
- B. If the worker believes the instructions are incorrect, the worker shall:
- Stop the activity, and place the equipment in a safe condition
 - Notify supervision
 - Proceed only after the procedure/work instruction is properly changed or resolution is obtained.
- C. Requirements for use of procedures/work instructions shall be clearly defined and understood by all personnel.

4.1.04 REQUIRED MINIMUM DOCUMENTATION – Available for CONTRACTOR/OWNER Review

- None.

OP-4.2 INTEGRATED WORK CONTROL REQUIREMENTS

This section establishes specific requirements for SUBCONTRACTORS doing work on RCCC projects.

4.2.01 INTEGRATED WORK CONTROL PROGRAM (IWCP)

- A. The SUBCONTRACTOR, working closely with the CONTRACTOR, shall utilize multi-disciplinary teamwork and worker involvement to support the identification and analysis of work site hazards associated with work scope for this subcontract in support of the integrated work control process.
- B. The SUBCONTRACTOR'S integrated work control process shall be performed in accordance with the CONTRACTOR'S procedure PAS-2-1.1, "Integrated Work Control" and PAS-2-1.4 "Job Hazard and What If Analysis" current revision. See Attachment OP-A1 for a copy of PAS-2-1.1 and OP-A2 for a copy of PAS-2-1.4. These procedures and forms will be accessible electronically for SUBCONTRACTOR personnel and CONTRACTOR will notify SUBCONTRACTOR of changes to these procedures.

Key elements of the procedure include the following:

- Assignment of the Responsible Manager, Work Planner, and Supervisor
 - Work Scope Development
 - Job Hazard Analysis
 - Work Package Preparation
 - Work Implementation
 - Changes to Work Packages
 - Work Completion
- C. As part of work performance, the SUBCONTRACTOR shall have available for review at any time, up-to-date and properly approved Work Documents.
- D. As part of work completion for each work activity, the SUBCONTRACTOR shall submit the final completed version of the Work Document. The final completed version shall include all revisions and modifications made to the initial Work Document.

4.2.02 IWCP ROLES AND RESPONSIBILITIES

D. The SUBCONTRACTOR will assume the roles and responsibilities for the listed personnel for the implementation of the Integrated Work Control process.

IWCP Organizational Title	WCH	SUBCONTRACTOR
Responsible Manager	X	
Work Control Planner		X
Work Supervisor		X

Note: The Environmental Restoration and Disposal Facility (ERDF) Super Cell 9 and 10 Construction Quality Assurance (CQA) Subcontractor shall work to the ERDF Super Cell 9 and 10 Construction Subcontractor's work packages utilizing Construction Subcontractor's Work Control Planner and Work Supervisor.

4.2.03 RESERVED

A. Reserved

B. Reserved

4.2.04 RESERVED

OP-5.0 SUBMITTALS and AVAILABLE DOCUMENTS

5.1 SUBMITTALS

Pursuant to the requirements of this Section, and the instructions provided in Exhibit I the following documentation is required to be submitted to the CONTRACTOR.

Exhibit K Subcontractor Submittal Requirements Summary

Submittal Schedule	Submittal Type Required	Distribution Designation
F - Prior to Fabrication	O - Original	SC - Submittal to Coordinator
S - Prior to Shipment	P - Prints/Photocopies	SA - Subcontract Administration
B - Prior to Balance of Payment	T - Transparencies	FM - Field/Functional Manager
A - Per S/C Schedule	M - Microfilm	ES - Engineering Services
M - Prior to Mobilization	PH - Photographs	ENV - Environmental Monitoring & Management
W - Prior to Commencing Work	FD - Floppy Disk	PAS - Project Activities & Services
U - Prior to Use	S - Sample	SH - Safety & Health
X - Prior to Purchase	(Q) - A number indicates quantity of copies	PR - Procurement
Y - Prior to Progress Payment for Each Specific Task	Q - _____	EC - Environmental Compliance
Z - As Required		DM - Data Management
1-4 - Number Indicates Calendar Days After Award		QA - Quality Assurance (Managed by QS and/or ARQP)
		EP - Fire Protection Engineer
		WM - Waste Management
		RC - Radiation Control
		AA - CONOPS Program Manager

Notices							
1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.							
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.							
Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY		
			Schedule	(No.) and Type	Review	Info	
7-00 OPERATIONS SUPPORT							
7-01	WCH-DE-023, CONOPS Applicability and Flow-down Worksheet	SC	W	O	FM/AA		
7-02	Subcontractor Controlled or Generated Completed Work Documents	SC	B	O	FM		

5.2 AVAILABLE DOCUMENTS

Pursuant to the requirements of this Section, the following items must be available upon request in a time manner to the CONTRACTOR and maintained by the SUBCONTRACTOR.

Exhibit K Subcontractor Available Documentation Requirements Summary		
Item No./ Available Document Title	Clause, * Specification, or Scope of Work Paragraph	
7-00 OPERATIONS SUPPORT		
7-51	Training and Required Reading Record for Work Supervisor	Exhibit "K", 4.2.03
7-52	Training and Required Reading Record for Work Control Planner	Exhibit "K", 4.2.05
7-53	All approved work documents	Exhibit "K", 4.2.01

OP-6.0 RESERVED

OP-7.0 ATTACHMENTS

PRO/DOC NUMBER	TITLE	REQUIREMENTS / CLAUSE
WCH-DE-023	CONOPS Applicability and Flowdown Worksheet	OP-4.1.01

Note: The Environmental Restoration and Disposal Facility (ERDF) Super Cell 9 and 10 Construction Quality Assurance (CQA) Subcontractor shall work to the ERDF Super Cell 9 and 10 Construction Subcontractor's CONOPS Applicability and Flowdown Worksheet as attached to this Exhibit K.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
Project/WA No: WCH STR: **Responsible Manager:** William Melvin
Project/WA Title: ARRA Project **Subcontractor Name:** TradeWind Services, LLC
Subcontract Title: Super Cells 9 & 10 Construction
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba **Title:** Sr. Construction Subcontract Engineer **Date:** 06/22/2010

Approvals:
 William Melvin / Responsible Manager
 Project Director/Responsible Manager (print name) _____ Signature _____ Date: _____
 Charles P. Arnes
 CONOPS Program Manager (print name) _____ Signature _____ Date: _____

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism		
				WCH Program/ Procedure	Subcontractor Program/ Procedure	
Ch 1	OPERATIONS ORGANIZATION AND ADMINISTRATION					
	1. Operations Policies	Y	Y	PM-ESHQ-3, Safety BSC-1-7.9, Preparing, Approving, and Issuing Policies and Charters	N/A	
	2. Resources	Y	Y	WCH Contractor Performance Plan (CPP)	N/A	
	3. Monitoring of Operating Performance	Y	Y	SEM-3.2.1, Accident/Incident Investigating and Reporting Requirements PM-ESHQ-13, Performance Analysis (See Note 1)	N/A	

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).
Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.
Note 4: The Subcontractor is required to implement these activities using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: ARRA Project William Melvin
Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba **Title:** Sr. Construction Subcontract Engineer **Date:** 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
4.	Accountability	Y	N	BSC-1-1.8, Performance Review and Disciplinary Action	(See NOTE 2)
5.	Management Training	Y	Y	BSC-1-2.1, Training Roles and Responsibilities	N/A
6.	Planning for Safety	Y	N	PAS-2-1.1, Integrated Work Control PAS-2-1.4, Job Hazard and What If Analysis	PAS-2.1.1 PAS-2-1.4 (See Note 4)

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: WCH STR: William Melvin
Subcontract Title: Responsible Manager: TradeWind Services, LLC
Subcontract No: Super Cells 9 & 10 Construction
Subcontract Type: R012308A00 Construction Services
Prepared by: Charles V. Skiba
Title: Sr. Construction Subcontract Engineer
Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 2	SHIFT ROUTINES AND OPERATING PRACTICES				
1.	Status Practices	Y	N	PAS-2.1.1, Integrated Work Control	(See Note 2)
2.	Safety Practices	Y	N	SH-1-2.1, Safety and Health Programs SH-1-2.6, Subcontractor Safety and Health Program	(See Note 2)
3.	Operator Inspection Tours	N	N	N/A	N/A
4.	Round/Tour Inspection Sheets	N	N	N/A	N/A
5.	Personal Protection	Y	N	RC-1-5.1, Conducting Radiological Work SH-1-2.6, Subcontractor Safety and Health Program	(See Note 2)
6.	Response to Indications	Y	N	PAS-2.1.1, Integrated Work Control	(See Note 2)
7.	Resetting Protective Devices	Y	N	SH-1-2.3, Electrical Safety	(See Note 2)
8.	Load Changes	N	N		
9.	Authority to Operate Equipment	Y	N	PAS-2.1.1, Integrated Work Control	(See Note 2)

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: B. Jack Howard
 Project/WA Title: William Melvin
 Subcontract Title: TradeWind Services, LLC
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba
 Title: Sr. Construction Subcontract Engineer
 Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 3	10. Shift Operating Bases	Y	N		(See Note 3)
	11. Potentially Distractive Written Material and Devices	Y	N		(See Note 3)
Ch 3	CONTROL AREA ACTIVITIES FOR DOE FACILITIES				
	1. Control Access Areas	N	N/A	N/A	N/A
	2. Professional Behavior	N	N/A	N/A	N/A
	3. Monitoring the Main Control Panels	N	N/A	N/A	N/A
	4. Control Operator Ancillary Duties	N	N/A	N/A	N/A
	5. Operation of Control Area Equipment	N	N/A	N/A	N/A
Ch 4	COMMUNICATIONS				
	1. Emergency Communications Systems	Y	Y	SEM-2-3.2, Emergency Preparedness Documentation	N/A
	2. Public Address System	N	N/A	N/A	N/A
	3. Contacting Operators	N	N/A	N/A	N/A
	4. Radios	N	N/A	N/A	N/A
	5. Abbreviations and Acronyms	N	N/A	N/A	N/A
	6. Oral Instructions and Informational Communications	Y	Y	CONOPS-1-4, Communications	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: WCH STR: William Melvin
Subcontract Title: Responsible Manager: TradeWind Services, LLC
Subcontract No: Subcontractor Name:
Subcontract Type: Sr. Construction Date: 06/22/2010
Prepared by: Charles V. Skiba Subcontract Engineer

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 5	CONTROL OF ON-SHIFT TRAINING				
	1. Adherence to Training Programs	N	N/A	N/A	N/A
	2. On-shift Instructor Qualification	N	N/A	N/A	N/A
	3. Qualified Operator Supervision and Control of Trainees	N	N/A	N/A	N/A
	4. Operator Qualification Program Approval	N	N/A	N/A	N/A
	5. Training Documentation	N	N/A	N/A	N/A
	6. Suspension of Training	N	N/A	N/A	N/A
	7. Maximum Number of Trainees	N	N/A	N/A	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 6	INVESTIGATION OF ABNORMAL EVENTS				
	1. Events Requiring Investigation	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	2. Investigation Responsibility	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	3. Investigator Qualification	Y	Y	SEM-3-2.2, Event Management	N/A
	4. Information to be Gathered	Y	Y	SEM-3-2.2, Event Management	N/A
	5. Event Investigation	Y	Y	SEM-3-2.2, Event Management	N/A
	6. Investigative Report	Y	Y	SEM-3-2.2, Event Management	N/A
	7. Event Training	Y	Y	BSC-1-2.4, Training Requirements	N/A
	8. Event Trending	Y	Y	SEM-3.1.2, Occurrence Categorization and Reporting	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: WCH STR: William Melvin
Subcontract Title: ARRA Project Responsible Manager: TradeWind Services, LLC
Subcontract No: Super Cells 9 & 10 Construction Subcontractor Name:
Subcontract Type: R012308A00
Prepared by: Construction Services
 Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
9.	Sabotage	Y	Y	SEM-1-2.3, Reporting Security Incidents SEM-3.2.2, Event Management	N/A
10.	Event Investigation - (SCRD B.7)	Y	Y	SEM-3-2.2, Event Management	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: ARRA Project WCH STR: William Melvin
Subcontract Title: Super Cells 9 & 10 Construction Responsible Manager: TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 7	NOTIFICATIONS				
	1. Notification Procedures	Y	N	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	(See NOTE 2)
	2. Notification Responsibility	Y	N	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	(See NOTE 2)
	3. Names and Phone Numbers	Y	N	SEM-3-1.1, Single Point of Contact	(See NOTE 2)
	4. Documentation	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	5. Communication Equipment	Y	Y	CONOPS-1-7, Notifications	N/A
	6. Notification Responsibility - (SCRD B.7)	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 8	CONTROL OF EQUIPMENT AND SYSTEM STATUS				
	1. Status Change Authorization and Reporting	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A
	2. Equipment and System Alignment	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A
	3. Equipment Locking and Tagging	Y	N	DOE-0336, Hanford Site Lockout/Tagout PAS-1-3.13, Miscellaneous Facility Tags	N/A
	4. Operational Limits Compliance	N	N/A	N/A	N/A
	5. Equipment Deficiency Identification and Documentation	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)
	6. Work Authorization and Documentation	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)
	7. Equipment Post-Maintenance Testing and Return to Service	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)
	8. Alarm Status	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS **FRC** **Waste Ops** **Mission Completion**
Project/WA No: **ARRA Project** **WCH STR:** B. Jack Howard
Project/WA Title: Super Cells 9 & 10 Construction **Responsible Manager:** William Melvin
Subcontract Title: R012308A00 **Subcontractor Name:** TradeWind Services, LLC
Subcontract No: Construction Services
Subcontract Type: Charles V. Skiba
Prepared by: Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
9.	Temporary Modification Control	N	N/A	N/A	N/A
10.	Distribution and Control of Equipment and System Documents	Y	Y	BSC-1-7.5, Document Control	N/A
11.	Work Authorization and Documentation - (SCRD B.5)	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: ARRA Project WCH STR: B. Jack Howard
 Project/WA Title: Super Cells 9 & 10 Construction Responsible Manager: William Melvin
 Subcontract No: R012308A00 Subcontractor Name: TradeWind Services, LLC
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism		
				WCH Program/ Procedure	Subcontractor Program/ Procedure	
Ch 9	LOCKOUTS AND TAGOUTS					
	1.	Lockout/Tagout Use	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	2.	Protective Materials and Hardware	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	3.	Lockout/Tagout Program	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	4.	Procedures for Lockout/Tagout	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	5.	Application of Lockout/Tagout	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	6.	Testing or Positioning of Equipment or Components	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	7.	Periodic Inspections	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	8.	Caution Tags	Y	Y	PAS-1-3.13, Miscellaneous Facility Tags	N/A
	9.	Training and Communication	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
10.	Lockout/Tagout or/Tagout Implementation	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A	

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion

Project/WA No: WCH STR: B. Jack Howard

Project/WA Title: ARRA Project Responsible Manager: William Melvin

Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC

Subcontract No: R012308A00

Subcontract Type: Construction Services

Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
11.	Notification of Personnel	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
12.	Outside Contractors	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
13.	Group Lockouts or Tagouts	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
14.	Shift or Personnel Changes	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
15.	Lockout/Tagout Processes at Hanford - (SCRD B.2)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
16.	Lockout/Tagout Use - (SCRD B.3)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
17.	Tagout Authorization Forms (TAF) - (SCRD B.4)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS **FRC** **Waste Ops** **Mission Completion**
Project/WA No: **WCH STR:** B. Jack Howard
Project/WA Title: ARRA Project **Responsible Manager:** William Melvin
Subcontract Title: Super Cells 9 & 10 Construction **Subcontractor Name:** TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba **Title:** Sr. Construction Subcontract Engineer **Date:** 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 10	INDEPENDENT VERIFICATION				
	1. Components Requiring Independent Verification	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
	2. Occasions Requiring Independent Verification	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
	3. Verification Techniques	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
Ch 11	LOGKEEPING				
	1. Establishment of Operating Logs	Y	Y	CONOPS-1-11, Log-keeping	N/A
	2. Timeliness of Recording	Y	Y	CONOPS-1-11, Log-keeping	N/A
	3. Information to be Recorded	Y	Y	CONOPS-1-11, Log-keeping	N/A
	4. Legibility	Y	Y	CONOPS-1-11, Log-keeping	N/A
	5. Corrections	Y	Y	CONOPS-1-11, Log-keeping	N/A
	6. Log Review	Y	Y	CONOPS-1-11, Log-keeping	N/A

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 Project/WA Title: ARRA Project Subcontractor Name: TradeWind Services, LLC
 Subcontract Title: Super Cells 9 & 10 Construction
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
7.	Care and Keeping of Logs	Y	Y	CONOPS-1-11, Log-keeping	N/A
Ch 12	OPERATIONS TURNOVER				
	1. Turnover Checklists	Y	Y	CONOPS-1-12, Operations Turnover	N/A
	2. Document Review	N	N/A	N/A	N/A
	3. Control Panel Walkdown	N	N/A	N/A	N/A
	4. Discussion and Exchange of Responsibility	N	N/A	N/A	N/A
	5. Shift Crew Briefing	N	N/A	N/A	N/A
	6. Relief's Occurring During the Shift	N	N/A	N/A	N/A
Ch 13	OPERATIONS ASPECTS OF FACILITY CHEMISTRY AND UNIQUE PROCESSES				
	1. Operator Responsibilities	N	N/A	N/A	N/A
	2. Operator Knowledge	N	N/A	N/A	N/A
	3. Operator Response to Process Problems	N	N/A	N/A	N/A
	4. Communicating Between Operations and Process Personnel	N	N/A	N/A	N/A

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Project/WA Title: Super Cells 9 & 10 Construction Responsible Manager: TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 14	REQUIRED READING				
	1. File Index	Y	N	BSC-1-2.11, Required Reading	
	2. Reading Assignments	Y	N	BSC-1-2.11, Required Reading	
	3. Required Dates for Completion of Reading	Y	N	BSC-1-2.11, Required Reading	
	4. Documentation	Y	N	BSC-1-2.11, Required Reading	
	5. Review	Y	N	BSC-1-2.11, Required Reading	

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CONOPS Applicability and Flowdown Worksheet

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Project/WA No: B. Jack Howard
Project/WA Title: ARRA Project **Responsible Manager:** William Melvin
Subcontract Title: Super Cells 9 & 10 Construction **Subcontractor Name:** TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba **Title:** Sr. Construction Subcontract Engineer **Date:** 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 15	TIMELY ORDERS TO OPERATORS				
	1. Content and Format	Y	Y	CONOPS-1-15, Timely Orders	N/A
	2. Issuing, Segregating, and Reviewing Orders	Y	Y	CONOPS-1-15, Timely Orders	N/A
	3. Removal of Orders	Y	Y	CONOPS-1-15, Timely Orders	N/A
Ch 16	OPERATIONS PROCEDURES				
	1. Procedure Development	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	2. Procedure Content	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	3. Procedure Changes and Revisions	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	4. Procedure Approval	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).
Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.
Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: ARRA Project **WCH STR:** William Melvin
Subcontract Title: Super Cells 9 & 10 Construction **Responsible Manager:** TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba **Title:** Sr. Construction Subcontract Engineer **Date:** 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
5.	Procedure Review	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
6.	Procedure Availability	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
7.	Procedure Use	Y	N	PAS-1.1.1, Technical Procedure Development and Implementation	(See NOTE 2)
Ch 17	OPERATOR AID POSTINGS				
	1. Operator Aid Development	Y	Y	CONOPS-1-17, Operator Aids	N/A
	2. Approval	Y	Y	CONOPS-1-17, Operator Aids	N/A
	3. Posting	Y	Y	CONOPS-1-17, Operator Aids	N/A
	4. Use of Operator Aids	Y	Y	CONOPS-1-17, Operator Aids	N/A
	5. Documentation	Y	Y	CONOPS-1-17, Operator Aids	N/A
	6. Review	Y	Y	CONOPS-1-17, Operator Aids	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: B. Jack Howard
 Project/WA Title: William Melvin
 Subcontract Title: TradeWind Services, LLC
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba
 Title: Sr. Construction Subcontract Engineer
 Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 18	EQUIPMENT AND PIPING LABELING				
	1. Components Requiring Labeling	Y	Y	CONOPS-1-18, Equipment and Piping Labeling	N/A
	2. Label Information	N	N/A	N/A	N/A
	3. Label Placement	N	N/A	N/A	N/A
	4. Replacing Labels	N	N/A	N/A	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
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CONOPS Applicability and Flowdown Worksheet Instructions

Block Id	Block Title	Instruction
1	Project:	Check Project Location (e.g., D4/ISS, FRC, Waste Ops)
2	Project/WA No:	Enter Project/Work Activity tracking number
3	WCH STR	Print name of STR if a subcontractor is assigned to the project/work package
4	Project/WA Title:	Enter Project/Work Activity title
5	Responsible Manager	Print name of Responsible Manager
6	Subcontract Title:	Enter title of subcontract (i.e., procurement) document
7	Subcontract Name:	Enter name of subcontractor
8	Subcontract No:	Enter Subcontract, Requisition or Procurement tracking number
9	Subcontract Type:	Enter Type of contract (e.g., onsite services, onsite materials, staff aug, etc.)
10	Prepared by:	Print/Sign Preparer's Name Print/Sign Preparer's Title Sign Date prepared
11	Approvals Project Director:	Print Project Director's/Responsible Manager's Name (RM signs when no deviations identified) Sign Project Director's/Responsible Manager's Title Sign Date Project Director/Responsible Manager approved worksheet
12	Approvals CONOPS Program Administrator:	Print CONOPS Program Manager's Name Sign CONOPS Program Manager's Title Sign Date CONOPS Program Manager approved worksheet

Column Guidance

For the **Applies (Y/N)** column:

- Y - requirement applies to the project/activity
 - N - requirement doesn't apply to the project/activity
- Typically, this column will represent the applicable sections identified in WCH-98 for that project.

For the **WCH as Administrator (Y/N)** column:

- Y - requirement applies, but WCH is going to maintain compliance control and implementation
- N - requirement applies and the subcontractor will be responsible for demonstration of compliance
- NA - requirement didn't apply as seen in the previous column *Applies (Y/N)*.

CONOPS Applicability and Flowdown Worksheet Instructions

For the **WCH Program/Procedure** column:

N/A if the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use their own procedure/program to implement the requirement.

N/A if the **WCH as Administrator (Y/N)** column was marked as **Y AND** the Subcontractor has no or minimal involvement. The WCH procedures may be provided in this instance

if the **WCH as Administrator (Y/N)** column was marked as **Y AND** the Subcontractor is required to directly support the performance of the requirement (e.g., LOTO), insert **WCH procedure/policy number (and section, if applicable)**.

If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use a **WCH/DOE procedure/program** to implement the requirement, insert **WCH/DOE procedure/policy number (and section, if applicable)**.

For the **Subcontractor Program/Procedure** column:

N/A if the **WCH as Administrator (Y/N)** column was marked as **Y**.

If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use a **WCH/DOE procedure/program** to implement the requirement, insert **WCH/DOE procedure/policy number (and section, if applicable)** (e.g., DOE-0336 for LOTO)

If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use their own procedure/program to implement the requirement, insert **Subcontractor procedure/policy number (and section, if applicable)**.

Document/CCN Number: ~~151352~~

Date: June 29, 2010

Duplicate CCN

*Corrected CCN
151368
7/4/10*

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	Melvin, W.F.	T2-10	
	Palmersheim, S.M.	H4-17	
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	X
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	NAME	MISN	With Att.
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X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- _____

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

CN- _____

Envirotech, S013213A00

CN- 010

Incorporate changes to Exhibit "K"

Comments:

Re-issued to change CCN #



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10

EXHIBIT K

REV. NO. 0

WASHINGTON CLOSURE HANFORD

**SUBCONTRACTOR
OPERATIONS SUPPORT REQUIREMENTS**

**For ERDF Super Cells 9 and 10 Construction Quality
Assurance (CQA)**

R013213A00

0

REQUISITION/CONTRACT NUMBER

REV. No.

Charles Ames/

Charles Ames

11/19/09

Approval

Date

TABLE OF CONTENTS

OP-1.0 PURPOSE/SCOPE	3
OP-2.0 CODES, STANDARDS, LAWS AND REGUALTIONS	3
OP-3.0 DEFINTIONS	3
OP-4.0 OPERATIONS SUPPORT REQUIREMENTS	3
OP-4.1 CONDUCT OF OPERATIONS REQUIREMENTS	4
4.1.01 CONDUCT OF OPERATIONS	4
4.1.02 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	4
OP-4.2 INTEGRATED WORK CONTROL REQUIREMENTS	5
4.2.01 INTEGRATED WORK CONTROL PROGRAM (IWCP)	5
4.2.02 IWCP ROLES AND RESPONSIBILITIES	6
OP-5.0 SUBMITTALS AND AVAILABLE DOCUMENTS.....	7
OP-6.0 FORMS.....	7
OP-7.0 ATTACHMENTS.....	7

OP-6.0 FORMS

K-01, WCH-DE-023, CONOPS Subcontractor Applicability and Flow-down Worksheet

OP-7.0 ATTACHMENTS

PAS-2.1.1, Integrated Work Control

PAS-2-1.4, Job Hazard and What If Analysis

FIGURES

None.

NOTE: All non-applicable Requirements are 'grayed out' in the Table of Contents, Forms and/or Submittal Lists.

SUBCONTRACTOR SAFETY AND HEALTH REQUIREMENTS

OP-1.0 PURPOSE/SCOPE

The requirements of this document are based on current conditions and/or operations in areas of the planned project. This document is to be used to assist the SUBCONTRACTOR in understanding the operations support requirements of a specific project. This document does not relieve the SUBCONTRACTOR of the requirement to plan for or provide a disciplined work control process for all work activities. This exhibit does not relieve the SUBCONTRACTOR or its lower-tier Subcontractor(s) from recognizing and complying with applicable laws, regulations, permits requirements and conditions set forth in Exhibit A - General Conditions. The term "personnel" includes both SUBCONTRACTOR and its subtier SUBCONTRACTORS' personnel.

The "Operations Support Requirements" provide specific instruction to SUBCONTRACTOR in areas where there are CONTRACTOR requirements in addition to regulatory requirements, or where emphasis is needed in portions of the regulations to ensure uniformity between the SUBCONTRACTOR'S program and those of the SUBCONTRACTOR'S operations and/or operations of other site CONTRACTORS.

Exhibit K incorporates all work control requirements applicable to performing work for WCH, and is hereby flowed down to SUBCONTRACTOR(s) and its lower tiers.

OP-2.0 CODES, STANDARDS, LAWS and REGULATIONS

A. In addition to the SUBCONTRACTOR operations support requirements listed in this document, the SUBCONTRACTOR shall comply with the most recent edition (unless otherwise noted) of the following (list is non-inclusive):

1. CRD O 5480.19, Change 2 (Supplemented Rev 3), Conduct of Operations Requirements for DOE Facilities, U.S. Department of Energy, Washington, D.C.
2. Integrated Work Control Program (WCH PAS-2) including the following procedures:
PAS-2-1.1, Integrated Work Control
PAS-2-1.4, Job Hazard and What If Analysis

OP-3.0 DEFINITIONS

None.

OP-4.0 OPERATIONS SUPPORT REQUIREMENTS

In performance of work under this subcontract, the SUBCONTRACTOR shall comply with the following CONTRACTOR Conduct of Operations and Integrated Work Control Process (IWCP) requirements.

OP-4.1 CONDUCT OF OPERATIONS REQUIREMENTS

4.1.01 CONDUCT OF OPERATIONS

A. The purpose of the Washington Closure Hanford (WCH) Conduct of Operations program is to ensure that facility operations are managed, organized, and conducted in a manner that results in a high level of performance and therefore contributes to safe and reliable operations. The elements of this program are fundamental to the manner in which operations are conducted to comply with Department of Energy (DOE) requirements. The SUBCONTRACTOR shall demonstrate that the mechanisms are in place to direct, monitor and verify implementation of the applicable portions of CRD O 5480.19, Conduct of Operations Requirements for DOE Facilities.

Required SUBCONTRACTOR Submittals (See Exhibit I)

- Form K-01, WCH-DE-023, "CONOPS Subcontractor Conduct of Operations Applicability Matrix." (4.1.01.A) [7-01]

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- None.

4.1.02 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

A. Within ten (10) working days of Subcontract execution and prior to commencement of any Work, the SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.

B. Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the work.

Required SUBCONTRACTOR Submittals (See Exhibit I)

- None.

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- None.

OP-4.2 INTEGRATED WORK CONTROL REQUIREMENTS

This section establishes specific requirements for SUBCONTRACTORS doing work on construction projects.

4.2.01 INTEGRATED WORK CONTROL PROGRAM (IWCP)

- A. The SUBCONTRACTOR, working closely with the CONTRACTOR, shall utilize multi-disciplinary teamwork and worker involvement to support the identification and analysis of work site hazards associated with work scope for this subcontract. The SUBCONTRACTOR shall be held responsible for strict compliance with all of the applicable requirements defined in PAS-2-1.1 "Integrated Work Control" current version."
- B. The SUBCONTRACTOR'S integrated work control process shall be performed in accordance with the CONTRACTOR'S procedure PAS-2-1.1, "Integrated Work Control" and PAS-2-1.4, "Job Hazard and What If Analysis" current revision. See Attachment OP-A1 for a copy of PAS-2-1.1 and OP-A2 for a copy of PAS-2-1.4. Updates to these procedures will be transmitted via Subcontract Change Notice.

Key elements of the procedure include the following:

- Assignment of the Responsible Manager, Work Planner, and Supervisor
- Work Scope Development
- Job Hazard Analysis
- Work Package Preparation
- Work Implementation
- Changes to Work Packages
- Work Completion

- C. **NOTE: Required where the SUBCONTRACTOR is performing the role of the Work Control Planner.** As part of Work Completion for each Work Package, the SUBCONTRACTOR shall submit the final version of the Work Package. The final version shall include all revisions and modifications made to the initial Work Package.

Required SUBCONTRACTOR Submittals (See Exhibit I)

- None.

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- None.

4.2.02 IWCP ROLES AND RESPONSIBILITIES

A. The SUBCONTRACTOR will assume the roles and responsibilities for the listed personnel for the implementation of the Integrated Work Control process.

IWCP Organizational Title	WCH	SUBCONTRACTOR
Project Director	X	-
Project Engineer	X	-
Responsible Manager	X	-
Work Control Planner	X	-
Work Supervisor	-	NOTE 1

Note 1: The subcontractor will work under the supervision of the construction subcontractor for the cells.

Required SUBCONTRACTOR Submittals (See Exhibit I)

- None.

Required Minimum Documentation-Available for CONTRACTOR/OWNER Review

- None.

OP-5.0 SUBMITTALS and AVAILABLE DOCUMENTS

Pursuant to the requirements of this Section, and the instructions provided in Exhibit I the following documentation is required to be submitted; available on/at the Hanford (job site or central work location.); or available from the SUBCONTRACTOR upon request in a timely manner.

Exhibit K Subcontractor Submittal Requirements Summary

Submittal Schedule		Submittal Type Required		Distribution Designation	
F	Prior to Fabrication	O	Original	SC	Submittal to Coordinator
S	Prior to Shipment	P	Prints/Photocopies	SA	Subcontract Administrator
B	Prior to Balance of Payment	T	Transparencies	FM	Field/Functional Manager
A	Per S/C Schedule	M	Microfilm	ES	Engineering Services
M	Prior to Mobilization	PH	Photographs	ENV	Environmental Monitoring & Management
W	Prior to Commencing Work	FD	Floppy Disk	PAS	Project Activities & Services
U	Prior to Use	S	Sample	SH	Safety & Health
X	Prior to Purchase	(2)	A number indicates quantity of copies	PR	Procurement
Y	Prior to Progress Payment for Each Specific Task	Q		EC	Environmental Compliance
Z	As Required			DM	Data Management
14	Number Indicates Calendar Days After Award			QA	Quality Assurance (Managed by QS and/or ARQP)
A				FP	Fire Protection Engineer
				WM	Waste Management
				RC	Radiation Control
				AA	

Notices						
1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.						
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.						
Item No./ Submittal Title	Clause, * Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY	
			Schedule	(No.) and Type	Review	Info
7-00 OPERATIONS SUPPORT						
7-01 WCH-DE-023, CONOPS Subcontractor Applicability and Flow-down Worksheet	Exhibit "K", 4.1.01	SC	W	O	FM	
7-02 Subcontractor Controlled or Generated Work Packages NOTE: Required when SUBCONTRACTOR is performing the role of the Work Control Planner	Exhibit "K", 4.2.02	SC	B	Ø	FM	

OP-6.0 FORMS

NUMBER	TITLE	REQUIREMENTS / CLAUSE
K-01	WCH-DE-023, CONOPS Subcontractor Applicability and Flow-down Worksheet	OP-4.1.01

OP-7.0 ATTACHMENTS

PRO/DOC NUMBER	TITLE	REQUIREMENTS / CLAUSE
PAS-2.1.1	INTEGRATED WORK CONTROL	OP-4.2.01
PAS-2-1.4	JOB HAZARD AND WHAT IF ANALYSIS	OP-4.2.01

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: WCH STR: C. V. Skiba
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010
Approvals: Bruce C. Covert Date: _____
 Project Director/Responsible Manager (print name) Signature
 Charles P. Ames Date: _____
 CONOPS Program Manager (print name) Signature

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism		
				WCH Program/ Procedure	Subcontractor Program/ Procedure	
Ch 1	OPERATIONS ORGANIZATION AND ADMINISTRATION					
	1. Operations Policies	Y	Y	PM-ESHQ-3, Safety BSC-1-7.9, Preparing, Approving, and Issuing Policies and Charters	N/A	
	2. Resources	Y	Y	WCH Contractor Performance Plan (CPP)	N/A	
	3. Monitoring of Operating Performance	Y	Y	SEM-3.2.1, Accident/Incident Investigating and Reporting Requirements PM-ESHQ-13, Performance Analysis (See Note 1)	N/A	

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Note 4: The Subcontractor is required to implement these activities using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS **FRC** **Waste Ops** **Mission Completion**
Project/WA No.: WCH STR: C. V. Skiba
Project/WA Title: ARRA Project **Responsible Manager:** William Melvin
Subcontract Title: Super Cells 9 & 10 CQA **Subcontractor Name:**
Subcontract No.: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug **Title:** Project Engineer **Date:** 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
4.	Accountability	Y	N (See NOTE 2)	BSC-1-1.8, Performance Review and Disciplinary Action	
5.	Management Training	Y	Y	BSC-1-2.1, Training Roles and Responsibilities	N/A
6.	Planning for Safety	Y	N	PAS-2-1.1, Integrated Work Control PAS-2-1.4, Job Hazard and What If Analysis	PAS-2.1.1 PAS-2-1.4 (See Note 4)

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS **FRC** **Waste Ops** **Mission Completion**
Project/WA No.: **ARRA Project** **WCH STR:** C.V. Skiba
Project/WA Title: **Super Cells 9 & 10 CQA** **Responsible Manager:** William Melvin
Subcontract No.: R013213A00 **Subcontractor Name:**
Subcontract Type: Construction
Prepared by: W.A. Borlaug **Title:** Project Engineer **Date:** 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 2	SHIFT ROUTINES AND OPERATING PRACTICES				
1.	Status Practices	Y	N (See Note 2)	PAS-2.1.1, Integrated Work Control	
2.	Safety Practices	Y	N (See Note 2)	SH-1-2.1, Safety and Health Programs SH-1-2.6, Subcontractor Safety and Health Program	
3.	Operator Inspection Tours				
4.	Round/Tour Inspection Sheets				
5.	Personal Protection	Y	N (See Note 2)	RC-1-5.1, Conducting Radiological Work SH-1-2.6, Subcontractor Safety and Health Program	
6.	Response to Indications	Y	N (See Note 2)	PAS-2.1.1, Integrated Work Control	
7.	Resetting Protective Devices	Y	N (See Note 2)	SH-1-2.3, Electrical Safety	
8.	Load Changes	N			
9.	Authority to Operate Equipment	Y	N (See Note 2)	PAS-2.1.1, Integrated Work Control	

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CONOPS Applicability and Flowdown Worksheet

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Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No.: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 3	10. Shift Operating Bases	Y	N (See Note 3)		
	11. Potentially Distractive Written Material and Devices	Y	N (See Note 3)		
	CONTROL AREA ACTIVITIES FOR DOE FACILITIES				
Ch 4	1. Control Access Areas	N	N/A		N/A
	2. Professional Behavior	N	N/A		N/A
	3. Monitoring the Main Control Panels	N	N/A		N/A
	4. Control Operator Ancillary Duties	N	N/A		N/A
	5. Operation of Control Area Equipment	N	N/A		N/A
	COMMUNICATIONS				
Ch 4	1. Emergency Communications Systems	Y	Y	SEM-2-3.2, Emergency Preparedness Documentation	N/A
	2. Public Address System	N	N/A		N/A
	3. Contacting Operators	N	N/A		N/A
	4. Radios	N	N/A		N/A
	5. Abbreviations and Acronyms	N	N/A		N/A
	6. Oral Instructions and Informational Communications	Y	Y	CONOPS-1-4, Communications	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).
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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: C.V. Skiba
Project/WA Title: ARRA Project WCH STR: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug

Title: Project Engineer **Date:** 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 5	CONTROL OF ON-SHIFT TRAINING				
	1.	Adherence to Training Programs	N	N/A	N/A
	2.	On-shift Instructor Qualification	N	N/A	N/A
	3.	Qualified Operator Supervision and Control of Trainees	N	N/A	N/A
	4.	Operator Qualification Program Approval	N	N/A	N/A
	5.	Training Documentation	N	N/A	N/A
	6.	Suspension of Training	N	N/A	N/A
	7.	Maximum Number of Trainees	N	N/A	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: WCH STR: C.V. Skiba
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism		
				WCH Program/ Procedure	Subcontractor Program/ Procedure	
Ch 6	INVESTIGATION OF ABNORMAL EVENTS					
	1.	Events Requiring Investigation	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	2.	Investigation Responsibility	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	3.	Investigator Qualification	Y	Y	SEM-3-2.2, Event Management	N/A
	4.	Information to be Gathered	Y	Y	SEM-3-2.2, Event Management	N/A
	5.	Event Investigation	Y	Y	SEM-3-2.2, Event Management	N/A
	6.	Investigative Report	Y	Y	SEM-3-2.2, Event Management	N/A
	7.	Event Training	Y	Y	BSC-1-2.4, Training Requirements	N/A
8.	Event Trending	Y	Y	SEM-3.1.2, Occurrence Categorization and Reporting	N/A	

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: C.V. Skiba
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
9.	Sabotage	Y	Y	SEM-1-2.3, Reporting Security Incidents SEM-3.2.2, Event Management	N/A
10.	Event Investigation - (SCRD B.7)	Y	Y	SEM-3-2.2, Event Management	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: WCH STR: C. V. Skiba
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 7	NOTIFICATIONS				
	1. Notification Procedures	Y	N (See NOTE 2)	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	
	2. Notification Responsibility	Y	N (See NOTE 2)	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	
	3. Names and Phone Numbers	Y	N (See NOTE 2)	SEM-3-1.1, Single Point of Contact	
	4. Documentation	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	5. Communication Equipment	Y	Y	CONOPS-1-7, Notifications	N/A
	6. Notification Responsibility - (SCRD B.7)	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion C.V. Skiba
Project/WA No: ARRA Project WCH STR: William Melvin
Project/WA Title: Super Cells 9 & 10 CQA Responsible Manager:
Subcontract Title: R013213A00 Subcontractor Name:
Subcontract No: Construction
Subcontract Type: W.A. Borlaug Title: Project Engineer Date: 01/26/2010
Prepared by:

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 8	CONTROL OF EQUIPMENT AND SYSTEM STATUS				
1.	Status Change Authorization and Reporting	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A
2.	Equipment and System Alignment	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A
3.	Equipment Locking and Tagging	Y	Y	DOE-0336, Hanford Site Lockout/Tagout PAS-1-3.13, Miscellaneous Facility Tags	DOE-0336 (SEE NOTE 4)
4.	Operational Limits Compliance	N	N/A	N/A	N/A
5.	Equipment Deficiency Identification and Documentation	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (SEE NOTE 4)
6.	Work Authorization and Documentation	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (SEE NOTE 4)
7.	Equipment Post-Maintenance Testing and Return to Service	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (SEE NOTE 4)
8.	Alarm Status	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A
9.	Temporary Modification Control	Y	N/A	N/A	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: ARRRA Project WCH STR: C. V. Skiba
Project/WA Title: Super Cells 9 & 10 CQA Responsible Manager: William Melvin
Subcontract No: R013213A00 Subcontractor Name:
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
10.	Distribution and Control of Equipment and System Documents	Y	Y	BSC-1-7.5, Document Control	N/A
11.	Work Authorization and Documentation - (SCRD B.5)	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (SEE NOTE 4)

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CONOPS Applicability and Flowdown Worksheet

Project: D4/SS FRC Waste Ops Mission Completion
Project/WA No: ARRA Project WCH STR: C.V. Skiba
Project/WA Title: Super Cells 9 & 10 CQA Responsible Manager: William Melvin
Subcontract No: R013213A00 Subcontractor Name:
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 9	LOCKOUTS AND TAGOUTS				
	1.	Lockout/Tagout Use	Y	Y	DOE-0336, Hanford Site Lockout/Tagout DOE-0336, Hanford Site Lockout/Tagout
	2.	Protective Materials and Hardware	Y	Y	DOE-0336, Hanford Site Lockout/Tagout
	3.	Lockout/Tagout Program	Y	Y	DOE-0336, Hanford Site Lockout/Tagout
	4.	Procedures for Lockout/Tagout	Y	Y	DOE-0336, Hanford Site Lockout/Tagout
	5.	Application of Lockout/Tagout	Y	Y	DOE-0336, Hanford Site Lockout/Tagout
	6.	Testing or Positioning of Equipment or Components	Y	Y	DOE-0336, Hanford Site Lockout/Tagout
	7.	Periodic Inspections	Y	Y	DOE-0336, Hanford Site Lockout/Tagout
	8.	Caution Tags	Y	Y	PAS-1-3.13, Miscellaneous Facility Tags DOE-0336, Hanford Site Lockout/Tagout DOE-0336, Hanford Site Lockout/Tagout
	9.	Training and Communication	Y	Y	DOE-0336, Hanford Site Lockout/Tagout DOE-0336, Hanford Site Lockout/Tagout
10.	Lockout/Tagout or/Tagout Implementation	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: C.V. Skiba
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
	11. Notification of Personnel	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	DOE-0336, (See NOTE 4)
	12. Outside Contractors	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	DOE-0336, (See NOTE 4)
	13. Group Lockouts or Tagouts	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	DOE-0336, (See NOTE 4)
	14. Shift or Personnel Changes	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	DOE-0336, (See NOTE 4)
	15. Lockout/Tagout Processes at Hanford - (SCRD B.2)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	DOE-0336, (See NOTE 4)
	16. Lockout/Tagout Use - (SCRD B.3)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	DOE-0336, (See NOTE 4)
	17. Tagout Authorization Forms (TAF) - (SCRD B.4)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	DOE-0336, (See NOTE 4)

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No.: WCH STR: C.V. Skiba
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No.: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism		
				WCH Program/ Procedure	Subcontractor Program/ Procedure	
Ch 10	INDEPENDENT VERIFICATION					
	1.	Components Requiring Independent Verification	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
	2.	Occurrences Requiring Independent Verification	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
	3.	Verification Techniques	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
Ch 11	LOGKEEPING					
	1.	Establishment of Operating Logs	Y	Y	CONOPS-1-11, Log-keeping	N/A
	2.	Timeliness of Recording	Y	Y	CONOPS-1-11, Log-keeping	N/A
	3.	Information to be Recorded	Y	Y	CONOPS-1-11, Log-keeping	N/A
	4.	Legibility	Y	Y	CONOPS-1-11, Log-keeping	N/A
	5.	Corrections	Y	Y	CONOPS-1-11, Log-keeping	N/A
	6.	Log Review	Y	Y	CONOPS-1-11, Log-keeping	N/A
7.	Care and Keeping of Logs	Y	Y	CONOPS-1-11, Log-keeping	N/A	

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS **FRC** **Waste Ops** **Mission Completion**
Project/WA No: **ARRA Project** **WCH STR:** C.V. Skiba
Project/WA Title: **Super Cells 9 & 10 CQA** **Responsible Manager:** William Melvin
Subcontract No: **R013213A00** **Subcontractor Name:**
Subcontract Type: **Construction**
Prepared by: **W.A. Borlaug** **Title:** **Project Engineer** **Date:** **01/26/2010**

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 12	OPERATIONS TURNOVER				
	1. Turnover Checklists	Y	Y	CONOPS-1-12, Operations Turnover	N/A
	2. Document Review	N	N/A	N/A	N/A
	3. Control Panel Walkdown	N	N/A	N/A	N/A
	4. Discussion and Exchange of Responsibility	N	N/A	N/A	N/A
	5. Shift Crew Briefing	N	N/A	N/A	N/A
Ch 13	OPERATIONS ASPECTS OF FACILITY CHEMISTRY AND UNIQUE PROCESSES				
	1. Operator Responsibilities	N	N/A	N/A	N/A
	2. Operator Knowledge	N	N/A	N/A	N/A
	3. Operator Response to Process Problems	N	N/A	N/A	N/A
	4. Communicating Between Operations and Process Personnel	N	N/A	N/A	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/SS FRC Waste Ops Mission Completion

Project/WA No: ARR A Project WCH STR: C.V. Skiba

Project/WA Title: Super Cells 9 & 10 CQA Responsible Manager: William Melvin

Subcontract Title: R013213A00 Subcontractor Name:

Subcontract No: Construction

Subcontract Type: W.A. Borlaug

Prepared by: Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 14	REQUIRED READING				
	1.	File Index	Y	Y	BSC-1-2.11, Required Reading N/A
	2.	Reading Assignments	Y	Y	BSC-1-2.11, Required Reading N/A
	3.	Required Dates for Completion of Reading	Y	Y	BSC-1-2.11, Required Reading N/A
	4.	Documentation	Y	Y	BSC-1-2.11, Required Reading N/A
	5.	Review	Y	Y	BSC-1-2.11, Required Reading N/A

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CONOPS Applicability and Flowdown Worksheet

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Project/WA No: C.V. Skiba
Project/WA Title: ARRA Project WCH STR: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Responsible Manager:
Subcontract No: R013213A00 Subcontractor Name:
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 15	TIMELY ORDERS TO OPERATORS				
	1. Content and Format	Y	Y	CONOPS-1-15, Timely Orders	N/A
	2. Issuing, Segregating, and Reviewing Orders	Y	Y	CONOPS-1-15, Timely Orders	N/A
	3. Removal of Orders	Y	Y	CONOPS-1-15, Timely Orders	N/A
Ch 16	OPERATIONS PROCEDURES				
	1. Procedure Development	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	2. Procedure Content	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	3. Procedure Changes and Revisions	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	4. Procedure Approval	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	5. Procedure Review	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A

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CONOPS Applicability and Flowdown Worksheet

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Project/WA No: C.V. Skiba
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
6.	Procedure Availability	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
7.	Procedure Use	Y	N (See NOTE 2)	PAS-1.1.1, Technical Procedure Development and Implementation	
Ch 17	OPERATOR AID POSTINGS				
1.	Operator Aid Development	Y	Y	CONOPS-1-17, Operator Aids	N/A
2.	Approval	Y	Y	CONOPS-1-17, Operator Aids	N/A
3.	Posting	Y	Y	CONOPS-1-17, Operator Aids	N/A
4.	Use of Operator Aids	Y	Y	CONOPS-1-17, Operator Aids	N/A
5.	Documentation	Y	Y	CONOPS-1-17, Operator Aids	N/A
6.	Review	Y	Y	CONOPS-1-17, Operator Aids	N/A

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Subcontract Title: Super Cells 9 & 10 CQA Subcontractor Name:
Subcontract No: R013213A00
Subcontract Type: Construction
Prepared by: W.A. Borlaug Title: Project Engineer Date: 01/26/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 18	EQUIPMENT AND PIPING LABELING				
	1. Components Requiring Labeling	Y	Y	CONOPS-1-18, Equipment and Piping Labeling	N/A
	2. Label Information	N	N/A	N/A	N/A
	3. Label Placement	N	N/A	N/A	N/A
	4. Replacing Labels	N	N/A	N/A	N/A

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CONOPS Applicability and Flowdown Worksheet Instructions

Block Id	Block Title	Instruction
1	Project:	Check Project Location (e.g., D4/ISS, FRC, Waste Ops)
2	Project/WA No:	Enter Project/Work Activity tracking number
3	WCH STR	Print name of STR if a subcontractor is assigned to the project/work package
4	Project/WA Title:	Enter Project/Work Activity title
5	Responsible Manager	Print name of Responsible Manager
6	Subcontract Title:	Enter title of subcontract (i.e., procurement) document
7	Subcontract Name:	Enter name of subcontractor
8	Subcontract No:	Enter Subcontract, Requisition or Procurement tracking number
9	Subcontract Type:	Enter Type of contract (e.g., onsite services, onsite materials, staff aug, etc.)
10	Prepared by:	Print/Sign Preparer's Name Print/Sign Preparer's Title Sign Date prepared
11	Approvals Project Director:	Print Project Director's/Responsible Manager's Name (RM signs when no deviations identified) Sign Project Director's/Responsible Manager's Title Sign Date Project Director/Responsible Manager approved worksheet
12	Approvals CONOPS Program Administrator:	Print CONOPS Program Manager's Name Sign CONOPS Program Manager's Title Sign Date CONOPS Program Manager approved worksheet

Column Guidance

For the **Applies (Y/N)** column:

Y - requirement applies to the project/activity

N - requirement doesn't apply to the project/activity

Typically, this column will represent the applicable sections identified in WCH-98 for that project.

For the **WCH as Administrator (Y/N)** column:

Y - requirement applies, but WCH is going to maintain compliance control and implementation

N - requirement applies and the subcontractor will be responsible for demonstration of compliance

NA - requirement didn't apply as seen in the previous column *Applies (Y/N)*.

CONOPS Applicability and Flowdown Worksheet Instructions

For the **WCH Program/Procedure** column:

N/A if the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use their own procedure/program to implement the requirement.

N/A if the **WCH as Administrator (Y/N)** column was marked as **Y AND** the Subcontractor has no or minimal involvement. The WCH procedures may be provided in this instance

If the **WCH as Administrator (Y/N)** column was marked as **Y AND** the Subcontractor is required to directly support the performance of the requirement (e.g., LOTO), insert WCH procedure/policy number (and section, if applicable).

If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use a WCH/DOE procedure/program to implement the requirement, insert WCH/DOE procedure/policy number (and section, if applicable).

For the **Subcontractor Program/Procedure** column:

N/A if the **WCH as Administrator (Y/N)** column was marked as **Y**.

If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use a WCH/DOE procedure/program to implement the requirement, insert WCH/DOE procedure/policy number (and section, if applicable) (e.g., DOE-0336 for LOTO)

If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use their own procedure/program to implement the requirement, insert Subcontractor procedure/policy number (and section, if applicable).

PAS-2, Integrated Work Control Program

Job Hazard and What If Analysis

Prepared By: Peter K. Wells

1.0 PURPOSE

The purpose of the Job Hazard Analysis (JHA) and What If Analysis (together referred to in this procedure, broadly, as the JHA) is to identify and analyze activity-specific hazards associated with both the work activity and/or the work site and to define a specific control set based on the hazards identified. [10 CFR 851.21 and 10 CFR 851.22]

This procedure details the process used to perform the JHA used by Washington Closure Hanford (WCH) and subcontractors in the planning of River Corridor Closure Contract (RCCC) work. The WCH JHA methodology utilizes multi-disciplinary teamwork and worker involvement to support the identification, analysis, and mitigation of work site hazards. This procedure implements some requirements of 10 CFR 851.

2.0 SCOPE

This procedure is used to prepare the JHA required for Integrated Work Control Program (IWCP) work packages (PAS-2-1.1, "Integrated Work Control"), Preventive Maintenance (PM) work packages (PAS-2-1.2, "Preventive Maintenance"), and technical procedures (PAS-1, *Project Activities and Support*, PAS-1-1.1, "Technical Procedure Development and Implementation").

This procedure is applicable to all work performed on the RCCC by WCH and is flowed down to subcontractors in accordance with the terms and conditions of subcontract documents.

All new JHAs shall be prepared in accordance with this procedure. Technical procedures and PM work packages using JHAs approved before the effective date of this procedure may be used as-is without changing the existing JHA. JHAs supporting Work Packages shall be changed to the new format as prescribed in PAS-2-1.1.

3.0 DEFINITIONS

Critical Resources: Personnel who are required to be present during the performance of work activities. Critical resources are identified in the JHA and identified in the section or step of the work package where needed. Critical resources include Supervisor, Project Safety Representative, Radiological Control (RadCon) Supervisor, and Industrial Hygienist.

Hazard Control Document (HCD): A generic term for a safety document that is used to identify and prescribe controls for the hazards in a particular location. Examples of this are the Health and Safety Plan (HASP), RCCC Hazard Identification and Mitigation Document (HIM), Site-Specific Health and Safety Plan (SSHASP), or the WCH Worker Safety and Health Program Plan (WSHP). All work activities are subject to the governing HCD(s).

Intermittent Resource: The resource identified shall be available on the work site when and where necessary and may cover multiple jobs.

Job Hazard Analysis (JHA): A documented process whereby a work activity is analyzed (using form WCH-FS-233) for hazards and a set of safety controls defined to eliminate or mitigate those hazards prior to the work being performed. This term includes both the Job Hazard and What If Analyses.

Planning Team: A panel selected by the RM or Manager to research the work, conduct the JHA and prepare the work package, PM, or technical procedure.

Responsible Manager (RM) / Manager: The person responsible for the initiation of a work package or technical procedure including the selection of the Planning Team that will conduct the JHA. An RM is responsible for IWCP and PM JHA development. A Manager is responsible for technical procedure JHA development.

Subject Matter Expert (SME): A person whose expertise in a particular field is relevant to and relied on during the JHA or review of the Work Package, as well as support of field work.

What If Analysis: A brainstorming approach that uses broad, loosely structured questioning to (1) postulate potential upsets that may result in accidents or system performance problems and (2) identify appropriate safeguards.

Work Control Planner / JHA Facilitator: A person qualified by training and experience to facilitate the Job Hazard Analysis.

Work Supervisor: The generic term used to identify Craft Supervisors, Field Superintendents, Subcontractor Site Superintendents, and any other supervisory personnel responsible for coordinating and directing worker activities in the field.

4.0 RESPONSIBILITIES

- | | |
|---|--|
| Project Director | <ul style="list-style-type: none">• Ensures self-assessments and surveillances of the JHA process are conducted to measure effectiveness and opportunities for improvement. |
| Responsible Manager (RM) / Manager | <ul style="list-style-type: none">• Selects the Planning Team members.• Communicates expectations to the Planning Team and ensures core functions and guiding principles of the Integrated Safety Management System (ISMS) are followed.• Performs final arbitration for comment resolution when necessary.• Ensures concurrence by the appropriate subject matter experts (SMEs) as part of the development of the JHA.• Approves the use of a tabletop JHA.• Reviews and approves all JHAs. |

Project Engineer, or designee	<ul style="list-style-type: none"> • Provides technical direction and ensures that engineering requirements (e.g., Authorization Basis [AB] and regulatory documents) are taken into consideration in the JHA.
Subject Matter Experts (SME) / Planning Team	<ul style="list-style-type: none"> • Participate in the work site, job/task walkdowns, and JHA planning as part of the Planning Team as required. • Ensure that JHA team decisions are consistent with his/her knowledge of the subject matter. • Sign the JHA coversheet to indicate concurrence.
Work Control Planner / JHA Facilitator	<ul style="list-style-type: none"> • Notifies the Planning Team Members of the impending JHA. • Reviews Lessons Learned database and feedback for entries with applicability to the work to be performed. • Facilitates the JHA using a Planning Team selected by the RM. • Identifies and prepares (or has prepared by others) the required permits and plans to support the JHA.
Work Supervisor	<ul style="list-style-type: none"> • Participates in the work site job/task walkdowns and JHA planning as part of the Planning Team.
Worker	<ul style="list-style-type: none"> • Participates in the work site and job/task walkdowns and JHA planning as part of the Planning Team as requested. • Identifies and proposes to the Planning Team the best tools and work practices for the job. • Identifies to the Work Supervisor or Work Control Planner any special material requirements for the work.
IWC Program Administrator	<ul style="list-style-type: none"> • Serves as the SME for the WCH Job Hazard Analysis Program.

5.0 PREREQUISITES/LIMITATIONS/CAUTIONS

- JHA facilitation requires completion of JHA Facilitator Training, Course # 105543, or the IWCP Work Control Planner Qualification Card, Course # 105982.
- Prior to site walkdowns, the HASP, radiological work permit (RWP), and/or other relevant HCD is reviewed by the Project Safety Representative (PSR) and other team members, as appropriate, for hazards that may be encountered during the walkdown.
- The JHA identifies a clear and concise activity-specific hazard mitigation strategy and is not used to reiterate the existing controls and site-wide training. Adding unnecessary information to the JHA serves only to camouflage the essential hazards and controls. Therefore, hazards and controls covered in the HASP, Hanford General Employee Training (HGET), other HCD, facility-wide controls or area access controls are not normally analyzed in the JHA. However, when ordinary hazards are intensified because of the work, (e.g., slip and falls from soapy water on plastic work area during asbestos abatement), these hazards are appropriately included in the analysis.

- Whenever possible, the Planning Team should perform the JHA as a group. Team performance of the JHA encourages effective real-time feedback and resolution of issues and concerns.
- The JHA must be as rigorous as necessary to identify and mitigate all known hazards to the work team, others, property, and the environment.

6.0 PROCEDURE

6.1 JHA Initiation and Preparation

- 6.1.1 The RM/Manager informs the Planner/Facilitator of the Planning Team membership (forwards the HDIT, if prepared). This team includes the following:

Mandatory

- Work Supervisor
- Members of the work group (selected by the Work Supervisor)
- Work Control Planner
- PSR

As required by the RM

- Radiological Engineer (mandatory for radiological work)
- Project Engineer (mandatory if AB controls are involved)
- Industrial Hygiene (IH) (as recommended by the PSR)
- Environmental Project Lead (EPL)
- Other SMEs identified by the RM.

NOTE: Whenever possible, the individuals performing the work are selected as members of the Planning Team.

NOTE: If the scope of the work changes during JHA development, the RM/Manager may adjust the Planning Team members as appropriate and notify the Planner/Facilitator accordingly.

- 6.1.2 The Planner/Facilitator notifies the Planning Team that they have been selected to participate in the JHA and gives the team the preliminary scope of the work activity.
- 6.1.3 The Planner/Facilitator and/or various project and Planning Team members may conduct walkdowns of the work area throughout all phases of JHA and work document planning and preparation.
- 6.1.4 The Planner/Facilitator prepares or coordinates the preparation of any permits that will be required to support the JHA.
- 6.1.5 The Planner/Facilitator checks the Lessons Learned and IWCP Feedback databases for items of interest related to the job scope. The Lessons Learned database is located at

<http://www.wch-rcc.com/sh/LESSONS/Lessons.htm> or the U.S. Department of Energy (DOE) Lessons Learned database at <http://www.hss.energy.gov/csa/Analysis/doell/index.asp>. The IWCP Feedback database is located on the WCH intranet under Web Tools.

- 6.1.6 The Planner/Facilitator prepares a draft JHA based on the draft task instruction/technical procedure (or the job task for a craft work package) as an aid during the hazard analysis process.

6.2 Job Hazard Analysis

- 6.2.1 The Planner/Facilitator recommends to the RM/Manager whether a walkdown or a tabletop discussion is appropriate.

- A walkdown is always the preferred method.
- A tabletop may be selected by the RM if the entire Planning Team has recent knowledge of the entire work area.
- If a walkdown is selected, it is to include all areas where work will be conducted unless waived by the RM. If an area is inaccessible, the RM shall be notified.
- A tabletop may be used if the risk from work site hazards outweighs the benefit from the team walking the site but other information (e.g., video, photographs, drawings, etc.) shall be used or obtained to support the tabletop.
- A tabletop discussion performed in lieu of a walkdown requires RM/Manager approval. The RM/Manager approval of the JHA is sufficient documentation.

NOTE: Whenever possible, the Planning Team should perform the JHA as a group. Team performance of the JHA encourages effective real-time feedback and resolution of issues and concerns.

- 6.2.2 If a tabletop will be conducted because the work area hazards preclude entry by the Planning Team, the Planner/Facilitator shall make every effort to obtain existing photographic and drawing information of the work site. If insufficient information is available, an entry by an individual or small group shall be made to gather information (e.g., notes, video, photographs) for the tabletop following safety protocols established for the entry.

NOTE: If a portion of the work area is not accessible during the JHA, (e.g., area not accessible during the walkdown), PAS-2-1.1 requires a HOLD POINT be placed in the Work Package so that work cannot proceed until the area becomes accessible, verification of the scope and an analysis of the hazards are conducted, the JHA and Work Package updated as required, and the HOLD POINT satisfied and signed.

- 6.2.3 The Planner/Facilitator schedules the walkdown and/or tabletop discussion and assembles the Planning Team.

1. Planning team members shall attend the scheduled JHA, or send a delegate that has signature authority.
2. The Planner/Facilitator will inform the RM/Manager if members of the Planning Team will not be present.
3. The RM/Manager will determine if a JHA should be conducted with members of the Planning Team absent, or rescheduled.

6.2.4 The Planning Team performs the following activities either prior to the walkdown or as part of the tabletop:

- Review relevant Lessons Learned and feedback.
- Consider safety aspects associated with protecting the environment and the public.
- The Project Engineer (or designee) ensures that any unique, activity-specific controls required by AB documents are identified to the Planning Team.
- Review previous radiological and industrial hygiene surveys where applicable
- Discuss known radiological, chemical, and metallurgical processes either associated with the work area directly or which sent waste or product material to the location.
- Review drawings, notes, video, photographs, and conduct discussions with team members familiar with the work site to identify hazardous locations or areas where access cannot be given to some members of the team (e.g., member not a beryllium worker).
- Planner/Facilitator will relate how the JHA and What If Analysis will be conducted.

6.2.5 The Planning Team performs the walkdown including the following activities (perform as part of Step 6.2.6 if the JHA is performed as a tabletop):

- The walkdown shall include all work areas where the scope of work will be performed and adjacent work areas that might be affected by the work or affect the work (not applicable for a tabletop).
- The Job Hazard Identification Work Sheet (WCH-FS-231) shall be used as a hazard identification tool in the JHA process.
 - Hazards identified on the Job Hazard Identification Work Sheet shall be presented in the JHA.
 - Program references (e.g., SH-1, *Safety and Health*, SH-1-3.5, "Fall Protection," for fall issues) for hazards identified in the Job Hazard Identification Work sheet will be consulted and used to formulate specific hazard controls.

- Document the existing field conditions (from photographs or other evidence if performing a tabletop).
- Discuss the proposed work steps or tasks and obtain team input on alternative approaches, most effective work sequence, or best methods to get the work done.
- Identify potential hazards associated with the work site and the work activities.
- Identify additional/different tools and equipment that may be used.
- Identify potential What If scenarios for discussion during the JHA.

6.2.6 The Planning Team assembles as a group in a suitable location (appropriately sized conference room recommended) and conducts the JHA (using form WCH-FS-233) including the following:

- a. Validate the work scope statement and update or correct as necessary.
- b. Review the basic job steps/activities and modify as necessary.

NOTE: The JHA may list each step in the work document, each major task, or a single activity.

- c. Identify work site and activity-specific hazards associated with each step or activity and document in the Potential Hazards column.
 - To avoid confusion, place the hazards on the form so that they are obviously tied to the activity. Several hazards may apply to an activity or step.
 - Allow enough room to write controls for each hazard in the next column (e.g., put each hazard on an individual line).
 - Ensure that hazards listed are actually hazards. Examples include: (1) a ladder is not a hazard, but falling from a ladder is a hazard, (2) torch use is not a hazard, but setting adjacent brush on fire is.
- d. Examine/analyze/evaluate the hazards that will be encountered for each job step or activity listed. Questions or lines of inquiry to consider in this analysis include but are not limited to the following:
 - Are there applicable regulations, codes, or standards that apply to this hazard?
 - Are there WCH programs or procedures that address the hazard (e.g., SH-1-3.5, "Fall Protection," for fall issues)
 - What are the potential pathways for the worker to be exposed to this hazard?
 - How much of the hazard is present (e.g., quantity of chemical, weight of container, height of hazard, voltage, or depth of excavation)?

- Is there an exposure limit associated with the hazard?
 - Is there a single point failure potential where one missed step can cause worker injury?
 - Is a new hazard being introduced during the work (removal of shielding, removal of interlocks, removal of facility safety systems, or introduction of inert gases)?
 - Are there lessons learned associated with the work or the hazard that should be captured?
- e. Determine the appropriate controls for each activity-specific hazard and document in the Controls column.
- i. Identify and list the minimum Critical and Intermittent Resources (personnel) for the activity.
 - ii. Identify and list the barriers for single point failure scenarios.
 - iii. Select hazard controls based on the following hierarchy:
 1. Elimination or substitution of the hazards where feasible and appropriate
 2. Engineered controls where feasible and appropriate
 3. Work practices and administrative controls that limit worker exposure
 4. Personal protective equipment (PPE).
 - iv. Select controls for hazards in the JHA other than PPE
 - Enter the controls selected by the team in the Controls column in the JHA.
 - To avoid confusion, place the controls on the form so that they are obviously tied to the hazard. Several controls may be used for a given hazard.
 - Allow enough room so that each of the controls is easily recognized and not overlooked.
 - If the controls are established by another approved hazard control document (e.g., RWP, Lead Plan, BWP), the approved HCD may be referenced in the JHA as the hazard control.

NOTE: Referencing the HCD compels the user to refresh themselves with all the controls listed in the referenced HCD.

- The controls established in each of the referenced HCDs shall be discussed in the JHA so that the team can evaluate the specific controls and the interrelations of all proposed controls.
- Evaluate and ensure that the implementation of a control has not created or amplified another hazard, or made another control ineffective.

v. Select PPE Controls for hazards in the JHA

NOTE: Unless otherwise stated in the JHA, the standard PPE for all WCH work is level D PPE.

- PPE selection may be included in the JHA in a number of ways:
 - If the PPE is known and will not change, it is appropriate to specify it in the JHA.
 - Plans and permits prescribing PPE including RWP, BWP, Lead Plan, etc., may be referenced.
 - If a single plan or permit is used, the PPE requirements are clear and no further action is required.
 - Where multiple plans or permits apply or if the PPE could be variable, a PPE Checklist (WCH-FS-243) shall be prepared to prescribe the PPE for the job or activity. The initial PPE Checklist (when used) shall be prepared prior to the approval of the JHA. When the PPE requirements change, a new PPE Checklist is prepared.
 - PPE selection shall be evaluated for potential conflict and any conflict resolved.
 - Each SME prescribing PPE through a PPE Checklist must sign indicating concurrence. The supervisor and RM/Manager will both approve the form.
- f. Describe the analysis/rationale for the control or reference the source of the control in the Analysis column. (The Analysis column shall not be used to list controls for hazards.) Examples of this include the following the following:
- Anticipated exposure above the action level of an airborne concentration of 2.5 micrograms of cadmium per cubic meter of air ($\mu\text{g}/\text{m}^3$), calculated as an 8-hour time weighted average (TWA), requires development and implementation of a comprehensive compliance plan (SH-1-4.10, "Cadmium").
 - Pathway for exposure to beryllium is (primarily) respiratory.
 - The water treatment piping may hold up to 4.5 cubic feet of chlorine gas which, if released in the work area, could cause severe injury or death.
 - The OSHA permissible exposure level (PEL) for hydrogen sulfide is 20 ppm.
 - Draining the 2-foot-thick water shield will cause gamma radiation to increase approximately 10 times and create a high radiation area in the room.
- g. Ensure that the controls selected are justified by the analysis.

- h. Review the requirements for crew training, qualification, and experience levels based on the activities and location. Identify additional training or qualification necessary to perform the work as a control.

NOTE: The Planning Team should be aware of the training and skill set of the work team. Additional training/qualification may be required for new tools, hazards, or control methods.

6.3 What If Analysis

The What If Analysis provides the team with another way to look at the hazards presented by the work and/or the work place. The What If Analysis is meant to be used by the Planning Team and therefore does not need formal calculation or probability studies to complete the analysis. Advice may be requested of SMEs outside the Planning Team if desired, but this is not mandatory.

The What If Analysis shall be considered for every JHA. However, when all hazards have been covered by the JHA (i.e., the team cannot think of any What If Analysis scenarios), write "none" in the What If portion of the form to show that the analysis was considered.

The What If Analysis is prepared on the JHA Form (WCH-FS-233) as follows:

1. Identify What If scenarios (all What If scenarios should be listed before proceeding to the next step. What-If questions can be formulated around human errors, process upsets, and equipment failures. Examples of these scenarios are as follows:
 - Failure of a Hazard Control from the JHA
 - Equipment or power failure
 - External influences such as biological encounters, etc.
 - Combination of events.

NOTE: An example of the What If Analysis is shown in Attachment 1.

2. Determine results or consequences to the What If questions or scenarios. This step is performed after all questions/scenarios have been identified. Enter the results identified in the "Result" column.
3. Assess the probability to occur and the severity of the consequence should it happen. The entries for likelihood and severity will determine whether there will be controls put in place for the scenario. Enter numbers 1 to 10 in each column with 1 the lowest probability and severity.
4. Discuss the individual scenarios and if they are considered credible by the team, analyze the hazard, and develop hazard control strategies to be included in the JHA and work document. If the scenario is determined to be not credible, enter N/A in the "Required Controls" column.
5. Ensure these control strategies are compatible with existing hazard controls from the JHA.

6.4 JHA Completion

1. Evaluate the final JHA and What If Analysis to ensure that all credible identified hazards have adequate controls.
2. Ensure that high-consequence activities are controlled such that breakdown of a single barrier would not cause a failure that would place personnel in jeopardy.
3. Complete the JHA in accordance with PAS-1-1.1, PAS-2-1.1, or PAS-2-1.2, as applicable.

6.5 Changes to the JHA

Changes to the JHA are made in accordance with PAS-1-1.1, PAS-2-1.1, or PAS-2-1.2, as applicable.

7.0 RECORDS

JHAs generated by this procedure shall be submitted with the associated work package or technical procedure to Document Control in accordance with the established Records Inventory and Disposition Schedule (RIDS) in BSC-1, *Business Services and Communications*, BSC-17.8, "Records Management."

8.0 JUSTIFICATION SUMMARY

Revision	Reason for Revision
0	New procedure

9.0 REFERENCES

- 10 CFR 851, "Worker Safety and Health Program," *Code of Federal Regulations*, as amended.
- BSC-1, *Business Services and Communications*, BSC-1-7.8, "Records Management," Washington Closure Hanford, Richland, Washington.
- PAS-1, *Project Activities and Support*, PAS-1-1.1, "Technical Procedure Development and Implementation," Washington Closure Hanford, Richland, Washington.
- PAS-2, *Integrated Work Control Program*, Washington Closure Hanford, Richland, Washington.
- PAS-2-1.1, "Integrated Work Control"
- PAS-2-1.2, "Preventive Maintenance"
- SH-1, *Safety and Health*, Washington Closure Hanford, Richland, Washington.
- SH-1-3.5, "Fall Protection"
- SH-1-4.10, "Cadmium"

WCH-4, 2007, *Integrated Environment, Safety, and Health Management System Description*, Washington Closure Hanford, Richland, Washington.

10.0 FORMS

WCH-FS-231, Job Hazard Identification Work Sheet

WCH-FS-233, Job Hazard Analysis

WCH-FS-243, Personal Protective Equipment Checklist

11.0 ATTACHMENTS

1. Job Hazard Analysis Example

Attachment 1: Job Hazard Analysis Example

JOB HAZARD ANALYSIS

Work Package/Procedure No./Rev. No.:		JHA Rev. No.:	Company/Organization:	Location:	Date:
Work Description:		Walkdown <input type="checkbox"/> Tabletop <input type="checkbox"/>			
MAJOR JOB STEP/ACTIVITY	POTENTIAL HAZARD	REQUIRED CONTROLS AND CRITICAL RESOURCES	ANALYSIS		
Isolation of power panel P-302 and removal of circuit breaker R-1 and associated conductors	Shock and Flash (220 VAC Power)	Lockout Tagout of branch circuit feeding P-302 NFPA 70e level 0 PPE for zero energy check Long sleeve shirt Long pants Safety glasses Zero energy check after lockout and prior to work in the panel	Hanford Site Lock and Tag Procedure (DOE-0336) -	Based on flash calculation performed on 8/1/2009 (filed in the Miscellaneous and Field Generated Paperwork Record)	
			Hanford Site Lock and Tag Procedure (DOE-0336) -		
"What If Scenarios"					
WHAT IF	RESULT	PROBABILITY	SEVERITY	REQUIRED CONTROLS	
The interior of the panel is radiologically contaminated by mud dauber wasps	Personnel contamination may occur	4	7	1. Electrician wear gloves when opening panel and performing zero energy check. 2. RCT evaluate panel for contamination after zero energy check has been completed (prior to work in the panel).	

REQUIRED READING SYNOPSIS

Complete this form and submit with administrative procedure revisions when Required Reading is selected as the level of training on the WCH-DC-002 form.

Procedure #: PAS-2-1.1	Rev: 5	Author: Peter K. Wells	Date: 8/31/2009
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Procedure Title: Integrated Work Control

I. Summary of Changes:

Integrated Work Control (IWC) was updated to incorporate opportunities for improvement and actions stemming from the Building 336 fall event. The most significant change involved the extraction of the Job Hazard Analysis process from this procedure and incorporation of that and What-if-Analysis into a new JHA procedure (PAS-2-1.4). Reference forms were also updated.

NOTE: No change bars appear in this revision due to the extensive nature of the changes made.

II. Primary Steps Affected and Synopsis for Each:

- Extracted the JHA process
- Deleted Type II Work Package option
- Risk Ranking process and form removed
- Reinforced when to stop or pause work
- Enhanced discussion of scope definition and development
- Added a requirement to re-review changes made to the work package after SME signatures are obtained but prior to RM approval
- Added requirement to perform a complete walk-down of the work site or insert a hold point in the task instructions (TI) prior to working in the inaccessible area
- Added identification of critical and intermittent resources in the JHA and TI
- Added identification of potential single point failure mechanisms that could result in personnel injury
- Clarified "Skill of the Craft" and "Routine Work" usage
- Added a prohibition for use of routine to "extend" a work package
- Reinforced roles, responsibilities, accountability and authority
- Added a cross check of hazard controls between the JHA and the TI
- Enhanced discussion of work authorization and work release
- Added discussion of "interactive Pre-Evolution Brief"
- Changed the Craft Work Package to require RM approval of all work activities
- Removed the use of "bullets" in work steps.
- Added the requirement to complete a PPE Checklist (form WCH-FS-243) when more than one source of PPE applies to the work
- Added a new example of the task instruction WARNING
- Removed the option of "Stacking" WARNINGS

FORMS

- WCH-FS-210: Changed the Pre-Evolution Brief Checklist form to emphasize interactive discussion of work activities and hazard controls
- WCH-FS-231: Made the Job Hazard Identification Work Sheet mandatory and added fall protection identification and communication to the sheet
- WCH-FS-233: Added new features to the JHA form
- WCH-FS-247: Removed the Risk Rank form and the Type II A-Pack Cover Sheet

III. Rationale for Changes:

Changes are based on opportunities for improvement collected since last revision and corrective actions from the Building 336 fall event. Changes were made to help ensure that a thorough hazard evaluation is performed based on an accurate scope of work, an accurate and sufficiently detailed task instruction is prepared and that supervision and other critical resources are in place during work activities.

Table of Contents

1.0	PURPOSE.....	1
2.0	SCOPE.....	1
3.0	DEFINITIONS	2
4.0	RESPONSIBILITIES	5
5.0	PREREQUISITES/LIMITATIONS/CAUTIONS	9
6.0	PROCEDURE	10
6.1	Routine Work.....	10
6.2	Work Package Initiation.....	11
6.3	Work Scope Development.....	12
6.4	Work Package Preparation	14
6.5	Work Package and JHA Approval	15
6.6	Work Package Implementation.....	16
6.7	Stopping and Re-Starting Work.....	19
6.8	Feedback.....	20
6.9	Changes to Work Packages and JHAs	20
6.10	Revisions to Work Packages.....	22
6.11	Post-Job Review	23
6.12	Work Package Completion.....	23
6.13	Work Package Closure.....	24
7.0	RECORDS	24
8.0	JUSTIFICATION SUMMARY	24
9.0	REFERENCES.....	24
10.0	FORMS	25
11.0	ATTACHMENTS	25
	Attachment 1 – Work Package Preparation, Formatting, And Use	26
	Attachment 2 – Work Package Reference Checklist.....	41

PAS-2, Integrated Work Control Program

Integrated Work Control

Prepared By: Peter K. Wells

1.0 PURPOSE

This procedure details the roles, responsibilities, and processes used to implement the Integrated Work Control Program (IWCP) used by Washington Closure Hanford (WCH) and its subcontractors to plan perform and control River Corridor Closure Contract (RCCC) work through Work Packages and routine work activities. [10 CFR 851.21] Portions of this procedure implement requirements of the WCH Worker Safety and Health Program Plan (WCH-4, Appendix H) for compliance to Title 10, *Code of Federal Regulations* (CFR) Part 851, "Worker Safety and Health Program." [10 CFR 851] The applicable portions are indicated by bracketed markers in the text.

Integrated Work Control (IWC) utilizes multi-disciplinary teamwork and worker involvement to support the development of Work Packages, the performance of work, and the use of the observational approach for newly identified hazards. [10 CFR 851.21 and 22] Also covered are Work Package administrative closeout activities. The Work Packages are developed and approved for release utilizing a graded approach based on risk and complexity of the work hazards and worker competence. [10 CFR 851.22]

2.0 SCOPE

The IWC (including Attachment 1) is applicable to all work activities managed and performed by WCH and its subcontractors with exceptions listed below:

- Preventive maintenance (PM) Work Packages are developed and implemented in accordance with PAS-2-1.2, "Preventive Maintenance."
- Preparation and implementation of Technical Procedures are in accordance with PAS-1, *Project Activities and Support*, PAS-1-1.1, "Technical Procedure Development."
- Work orders to obtain work from other Hanford Contractors (OHCs) are prepared in accordance with BSC-1, *Business Services and Communications*, BSC-1-8.6, "Obtaining Services from Other Hanford Site Contractors." The OHC provides products or services in a manner that is consistent with the requirements of its U.S. Department of Energy (DOE) prime contract. Work control, health and safety, and environmental compliance requirements are in accordance with the terms and conditions of the work order.
- Administrative and clerical services, including but not limited to, meetings, classroom training, preparing payroll, filing, keyboarding, document preparation, etc. Persons conducting work on these activities shall follow the functions and principles of Integrated Environmental, Safety, and Health Management System (ISMS) and other site infrastructure requirements. These activities are covered under the WCH Worker Safety and Health

Program Plan. This plan is located in WCH-4, *Integrated Environment, Safety, and Health Management System Description* (ISMSD), Appendix H.

IWC is flowed down to subcontractors in accordance with subcontract terms and conditions as required by subcontract documents. [10 CFR 851.A1] For subcontracted work, the IWC key roles may be filled by WCH or subcontractor personnel, as specified in subcontract documents.

All new Work Packages and their JHAs shall be prepared and performed in accordance with this procedure. Work packages and associated JHAs approved before the effective date of this procedure shall be revised to IWC revision 5 within a period of 4 months from the effective date. Type II Work Packages shall also be replaced with individual Type I Work Packages within the 4-month period.

3.0 DEFINITIONS

Authorization Basis (AB): Those aspects of design basis and operational requirements considered to be important to the safety of facility operations and relied on by DOE and contractor to authorize work.

Craft Work Package: The Craft Work Package is used when the work performed is of such a nature that (1) the work is considered skill of the craft, and (2) step-by-step instructions are not necessary to accomplish safe performance of the task(s). This work may be repetitive in nature.

Critical Resources: Personnel who are required to be present during the performance of work activities. Critical resources are identified in the JHA and identified in the section or step of the Work Package where needed. Critical resources include Supervisor, Project Safety Representative, Radiological Control (RadCon) Supervisor, and Industrial Hygienist.

Dedicated Resource: When identified as a critical resource, that person is required to be at the work site continuously except for short breaks (e.g., rest room break). The resource is required to be at the work site during all identified activities.

Field Work: Those activities occurring in the active work site (e.g., demolition, sort and load, etc.) as opposed to those activities conducted in the office areas (e.g., copier servicing, vendor delivery, etc.)

Hazard Control Document (HCD): A generic term for a safety document that is used to identify and prescribe controls for the hazards in a particular location. Examples of this are the Health and Safety Plan (HASP), RCCC Hazard Identification and Mitigation Document (HIM), Site-Specific Health and Safety Plan (SSHASP), or the WCH Worker Safety and Health Program Plan (WSHP). All work activities are subject to the governing HCD(s).

History File: A file set up for a particular Work Package to maintain record information associated with the Work Package. The history file is used to contain superseded documents and revisions, Pre-Evolution briefings (Pre-Ev), and other documents not needed in the Work Package to perform the work, but necessary to reconcile with the package for document closure. The file is maintained in a location to protect record information (minimum is in a lockable file cabinet).

Hold Point: A step in the procedure or point in the process beyond which an activity shall not proceed until a specified action or verification has occurred and been documented.

Independent Verification: A separate qualified person, operating independently and after the original activity, who verifies that a given procedure step, operation, or the position of a component conforms to established criteria without changing the position of the component.

Intermittent Resource: The resource identified shall be available on the work site when and where necessary and may cover multiple jobs.

Job Hazard Analysis (JHA): A documented process (in accordance with PAS-2-1.4, "Job Hazard and What If Analysis") whereby a work activity is analyzed for hazards and a set of safety controls defined to eliminate or mitigate those hazards prior to the work being performed. This term includes both the Job Hazard and What If Analyses.

Major Change: Any change that does not fit the definition of a Minor Change.

Minor Change: A change to a Work Package or JHA consisting of editorial changes or corrections, or addition of clarifying text or documents. These types of changes serve to enhance the functionality of the work documents in the field, but do not change the stated work scope, intent of the work steps, or hazard controls.

Observational Approach: An approach to performing work activities that is built on two fundamental concepts: "think before doing" and "recognition of changing conditions." These cornerstones ensure personnel that are performing the work activities understand the scope and hazards of the evolution and stop when a changed condition is encountered.

Pre-evolution Brief (Pre-Ev): A formal job briefing, based on ISMS principles, that is performed daily for each Work Package used. The Pre-Ev provides the work team with the necessary information about the job to be performed and provides a venue for feedback and process improvement.

Record: Material originated or received by a specific office in carrying out its objectives that needs to be kept for administrative, legal, research, scientific, or historical value, and that has had all required information entered and has been signed, stamped, or otherwise validated or authenticated and dated, as required.

Responsible Manager (RM): Appointed by the Project Director and trained specifically for the position, the manager directly responsible and accountable for the planning, implementation, and performance of the work (e.g., Area Manager, Area Superintendent, Utilities Manager, Subcontractor Project Manager/Director, Subcontract Technical Representative).

Senior Management Review Team (SMRT): A team of senior project/functional managers sponsored by project senior management assigned to review the Work Package and supporting documentation for completeness regarding safety, hazards, and work planning prior to release.

Skill of the Craft: Knowledge and activities related to certain aspects of a task or job that an individual is able to recall or perform without the aid of written instructions.

Subcontract Technical Representative (STR): The point of contact who provides technical direction and oversight of a subcontract and monitors subcontractor's performance.

Subject Matter Expert (SME): A person whose expertise in a particular field is relevant to and relied on during the JHA or review of the Work Package, as well as support of field work.

Type I Work Package: The Type I Work Package is used where the work is of such a nature that detailed work instructions are required and work must be performed in a specified sequence.

Unreviewed Safety Question (USQ): A situation where any of the following may occur: (1) the probability of occurrence or the consequences of an accident or the malfunction of equipment important to safety previously evaluated in the documented safety analysis (DSA) could be increased, (2) the possibility of an accident or malfunction of a different type than any evaluated previously in the DSA could be created, (3) a margin of safety could be reduced, or (4) the DSA may not be bounding or may be otherwise inadequate.

Work Authorization: The process by which the RM authorizes field work (either Work Package or routine work) in writing on a daily basis. Authorization indicates that the RM considers all the field operations under his/her control are safe to perform.

Work Control Planner: A person qualified by training, experience and completion of the qualification process to prepare IWC Work Packages and facilitate the JHA.

Work Package: A document developed using the IWC process and used to guide work/task performance. Two (2) types of Work Packages (Craft and Type I) are used in the IWC process to support a graded approach to work planning. The Work Package includes Task Instructions, support documents or references such as drawings or other technical guidance, permits, and approvals necessary to safely accomplish a work activity safely.

Work Package Approval: The process by which the RM approves the content of the Work Package as adequate to perform the work safely within the hazard controls and signifies that the Work Package contains all the controls from the JHA.

Work Package Release: The point at which the Work Supervisor signs the Pre-Ev indicating that all prerequisites have been met for the work.

Work Supervisor: The generic term used to identify Craft Supervisors, Field Superintendents, Subcontractor Site Superintendents, and any other supervisory personnel responsible for coordinating and directing worker activities in the field. These individuals are also trained to participate in the IWC work planning process.

Workability Review: A walkdown or a tabletop review of the Task Instruction portion of a Work Package with the end users to verify that the instructions can be performed as written. This workability review uses form WCH-FS-260 to provide instructions and document completion.

4.0 RESPONSIBILITIES

Project Director

- Designates the Responsible Manager (RM) and ensures that RMs are properly trained.
- Ensures oversight activities by line management to verify work is performed safely and IWCP is adequately implemented.
- Ensures self-assessments of the IWCP process are scheduled and periodic qualitative reviews of Work Packages are conducted to measure compliance, effectiveness, and opportunities for improvement.
- Ensures periodic surveillances of Work Packages and procedure use and adherence are conducted by the project team to measure compliance and opportunities for improvement.

Responsible Manager (RM)

- Selects the Planning Team members.
- Determines the type of work document to be used for each work task.
- Communicates expectations to the Planning Team and ensures core functions and guiding principles of ISMS are followed.
- Performs final arbitration for comment resolution when necessary.
- Ensures concurrence by the appropriate subject matter experts (SMEs) as part of the development of the Work Package.
- Reviews and approves all Work Packages and JHAs.
- Ensures the timing of all work activities will support safe performance of the work.
- Ensures that all critical resources required for the safe performance of the work are available before authorizing work.
- Reviews and authorizes all work.
- Ensures the safety and health of workers during the implementation of work activities. Overall safety of the workers is the responsibility of the RM.
- Creates an environment for feedback that encourages openness, honesty, and fosters a genuine desire to improve safety performance.
- Ensures systems or components that require independent verification have been designated.

- Reviews and approves changes to and revision of Work Packages.
 - Ensures that an IWCP feedback process is effectively implemented.
 - Ensures that Work Packages have been properly completed and closed out.
- Project Engineer, or designee**
- Provides technical direction and ensures that engineering requirements (e.g., Authorization Basis [AB] and regulatory documents) are in place prior to initiating work.
 - Evaluates the work scope to ensure that the impact to any adjacent nuclear facilities having the final hazard categorization (FHC) of Hazard Category 1, Hazard Category 2, Hazard Category 3, or Below Hazard Category 3 is evaluated. This includes interfacing with the contractor responsible for the affected nuclear facility and notification of the proposed work activity.
 - Reviews the completed Task Instruction to ensure that the steps with AB or other regulatory controls are properly inserted and clearly marked.
 - Evaluates abnormal conditions impacting performance of work activities, obtains engineering evaluations, and provides dispositions.
 - Reviews subcontractor prepared test documents for suitability.
 - Reviews completed Work Packages to ensure that as-left conditions are documented for future reference (e.g., electrical as-builts) and use by other projects.
 - Ensures that work impacting facility configuration is addressed in accordance with ENG-1, *Engineering Services*, ENG-1.1.1, "Engineering Services Overview," and ENG1-3.3, "Configuration Management."
- Subject Matter Experts (SME)**
- Participate in the work site job/task walkdowns as part of the Planning Team as requested.
 - Ensure that JHA team decisions are consistent with his/her knowledge of the subject matter.
 - Review draft Task Instructions to ensure that the work is consistent with his/her knowledge of the subject matter.
 - Review draft Task Instructions to ensure that the hazard controls from the JHA have been incorporated into the Task Instructions consistent with his/her knowledge of the subject matter.

- Sign the Work Package Cover Sheet (as directed by the RM) to indicate concurrence with the Work Package.
- Work Control Planner**
- Facilitates the JHA using a Planning Team selected by the RM.
 - Reviews Lessons Learned database and feedback for entries with applicability to the work to be performed.
 - Develops the Work Package incorporating input from the Planning Team, the RM, and appropriate task related requirements.
 - Identifies and prepares (or has prepared by others) the required plant forces work review (PFWR) and permits.
 - Supports the Work Supervisor in procuring the equipment and material(s) necessary for the work.
 - Coordinates with Radiological Control to ensure the radiological work permit (RWP) (if applicable) is prepared to support the work.
 - Coordinates Work Package comment resolution and submits the package for concurrence by selected members of the Planning Team and approval by the RM.
 - Ensures all documents necessary for completion of the work are included in the Work Package.
 - When possible, attends the Pre-Ev to compile feedback for process improvement.
 - Ensures that personal protective equipment (PPE) requirements are clearly delineated in the Work Packages or supporting documents.
- Work Supervisor**
- Participates in the work site job/task walkdowns as part of the Planning Team.
 - Signs the Work Package Cover Sheet to indicate concurrence with the Work Package.
 - Ensures the Work Package is approved and authorized for the day and releases the Work Package for work each day.
 - Ensures that the prerequisites for work have been performed.
 - Ensures that corrective actions for unsafe or unhealthy conditions are implemented and hazards are correctly posted.
 - Ensures that all personnel entering the work site have read and signed the current HCD indicating their understanding.
 - Ensures referenced documents are current prior to start of work.

- Authorizes shutdown of machinery, equipment, and systems and ensures hazardous energy control program requirements have been implemented prior to commencing work activities.
- Conducts Pre-EV briefings, documenting worker attendance and review of hazards and controls.
- Ensures workers are aware of their responsibility to stop work and notify supervision whenever changing conditions or unidentified hazards are encountered or work practices compromise quality or safety.
- Reviews training requirements and ensures workers are qualified to perform their duties.
- Ensures that personnel performing routine work (work not covered by a Work Package) are properly briefed on the scope of the work, methods, and tools to be used and that the hazards of these activities are understood by the workers and controlled.
- Ensures that Subcontractors perform routine work in accordance with ISMS principles. At a minimum, the subcontractor's supervisor and work crew will meet with the WCH supervisor/STR to step through in detail the processes they will follow, identify potential hazards, and describe methods to control those hazards.
- Ensures that waste management personnel are contacted when work activities will generate waste.
- Ensures workers are correctly wearing the required PPE.
- Ensures a proper turnover of work status when transferring Work Supervisor responsibilities.
- Complies with the IWC change and revision process.
- Ensures that good housekeeping practices are followed during performance of work, and that work areas are cleaned and restored after completion of work.
- Prepares and submits feedback in a timely manner to capture information for process improvement.
- Participates in the work site and job/task walkdowns as part of the Planning Team as requested.
- Identifies and proposes to the Planning Team the best tools and work practices for the job.
- Identifies to the Work Supervisor and/or Work Control Planner any special material requirements for the work.
- Participates in a Work Package workability review (as required) to ensure the adequacy of the Work Packages.

Worker

**IWC Program
Administrator**

- Participates in the Pre-Ev and does not perform work until properly briefed and the scope of work is clearly understood.
- Completes work activities in accordance with the Work Package.
- Adheres to all requirements of supporting documents including the RWP, Site-Specific Waste Management Instruction (SSWMI), and HCD(s).
- Stops work and notifies the Work Supervisor if a change of scope is identified, changing conditions or unidentified hazards are encountered, or work practices will compromise safety or the environment.
- Identifies feedback and process improvement opportunities to the Work Supervisor.
- Establishes and maintains the Integrated Work Control Program (IWCP) including key implementing procedures and associated training.
- Serves as the SME for the WCH IWCP.
- Evaluates feedback for inclusion into the feedback shared information folder.
- Performs periodic assessments and surveillances of project IWC performance to supplement project assessments.
- Distributes feedback as necessary and in an appropriate format to affected personnel.
- Develops appropriate training for IWC.

5.0 PREREQUISITES/LIMITATIONS/CAUTIONS

Routine work shall not be performed as a means of adding scope or activities to a Work Package (e.g., performing some emergent activities as “routine work” or “skill of the craft” instead of changing the Work Package to add the activities).

Prior to performing work in an area controlled by another project, ensure that the RM responsible for the work area gives permission to conduct the activity. This ensures the necessary integration of work activities.

In order to ensure proper checks and balances are applied within the work planning and approval process, the RM who approves a Work Package cannot also be the Planner who wrote the Work Package.

The RM's responsibilities can be transferred between any appropriately designated RMs that have been approved by the Project Director.

6.0 PROCEDURE

When personnel designated for concurrence or approval are not present, signatures may be obtained per telephone communication (telecom) or e-mail and documented on or adjacent to the signature block or in the Work Package Status Log. (Signature block example: "John Doe for Bob Smith per telecom, 7/11/2008")

6.1 Routine Work

The RM may authorize certain activities to be performed as routine work for their worksite; any work (excluding work that is exempt from IWC) that does not require a Work Package is considered routine work.

6.1.1 Routine Work Guidelines

- Routine work tasks are repetitive, familiar, and have low potential risk of exposing workers to hazards not addressed in general safety documents/training such as HASP, ISMSD, and Hanford General Employee Training.
- The RM assigning and authorizing routine work activities relies in large part on the skill of the craft assigned to perform them.
- All wastes generated by routine work activities shall be compliantly managed.

6.1.2 Routine Work Examples

The following are **examples of (including but not limited to) types of work** that the RM may consider to be routine:

- Routine field visits.
- Routine operation, repair, and servicing of vehicles including automobiles, trucks, graders, forklifts, etc. Routine repair and servicing includes equipment inspections, fueling, vehicle tire changes, minor engine repair/tune-up, battery testing, fluid replacement, etc.
- Routine repair and servicing of office equipment including computers, drives, scanners, fax machines, Wi-Fi equipment, copiers, telephones, electric punching/cutting and stapling equipment, typewriters, office furniture, date/time stamps, postage meters, shredders, blueprint machines, printers, etc.
- Routine plumbing work, including rework/replacement of restroom fixtures or plumbing (or unplug/clean-out drains), gas bottle change-out, rework/replacement of filter assemblies, periodic replacement of filter cartridges, handrail fabrication and cleaning of window-mounted heating, ventilation, and air conditioning (HVAC) units.
- Routine support services including snow removal, warehouse pickup, delivery, storage/stocking, storage area pickup and cleanup, sanitary servicing, deliveries and stocking, commodity vendor services (e.g., paper/office suppliers, refilling vending machines); janitorial services; office moves, furniture moves, office cubicle reconfigurations (not involving electrical work), fire extinguisher checks, and lawn care and grounds

maintenance (e.g., mowing grass, tree trimming) excluding activities resulting in soil disturbances.

- Routine performance of technical or professional services, inspections, walkdowns, assessments, or surveillances as long as hands-on work is not performed.
- Routine shop operations including set up of transmitters and controllers, small tool repair and maintenance, maintenance of electronic equipment, non-code welding, metal fabrication and assembly, carpentry, sign making, label making, laminating, and component painting.
- Non-RCRA, non-CERCLA, or non-radiological painting performed by WCH resources.

NOTE: Routine radiological surveys and industrial hygiene (IH) monitoring are performed in accordance with approved procedures.

6.2 Work Package Initiation

- 6.2.1 The RM completes or directs completion of Section 1 of the Work Process Form (WPF) (WCH-FS-229).
- 6.2.2 The RM forwards the WPF to the Project Engineer, or designee.
- 6.2.3 The Project Engineer (or designee) reviews Section 1 of the WPF to ensure that all prerequisite engineering and environmental requirements have been met (or are being addressed), and for any impacts to any (WCH or other) adjacent nuclear facility having a final hazard categorization of Hazard Category 2, Hazard Category 3, or below Hazard Category 3. The Project Engineer (or designee) completes Section 2 and forwards the WPF to the RM. [10 CFR 851.22]
- 6.2.4 The RM reviews Sections 1 and 2 of the WPF for completeness and designates the type of Work Package to be prepared for the work activity.
- 6.2.5 The RM completes Section 3 of the WPF, including selection of the Senior Management Review Team (SMRT) or workability review (if desired) and provides any additional instructions.

NOTE: The RM may require a SMRT or workability review at any time during the Work Package preparation process.

- 6.2.6 The RM identifies the Planning Team. The RM may use the Hazard and Discipline Identification Tool (HDIT) (WCH-FS-230) to aid in performing this activity. The Planning Team is responsible for all phases of Work Package preparation from scope definition and the JHA through Work Package concurrence. This team includes the following [10 CFR 851.A1]:

Mandatory

- Work Supervisor
- Members of the work group (selected by the Work Supervisor)

- Work Control Planner
- Project Safety Representative (PSR)

As required by the RM

- Radiological Engineer (mandatory for radiological work)
- Project Engineer (mandatory if AB controls are involved)
- Industrial Hygiene (IH) (as recommended by the PSR)
- Environmental Project Lead (EPL)
- Other SMEs identified by the RM.

NOTE: Whenever possible, representation by the individuals performing the work should be selected as members of the Planning Team.

- 6.2.7 The RM forwards the WPF (and HDIT, if prepared) to the Work Control Planner.
- 6.2.8 The Work Control Planner obtains a Work Package number from the Project Engineer (or designee).

NOTE: The Work Package number is a unique 12-character code assigned and recorded in a project Work Package log. The number uses a three-character area or project identifier (e.g., FRD, 100, SMU), two-digit calendar year (YY), two-digit month (MM), two-digit day (DD), and next sequential three-digit number from the area Work Package log (XXX).

6.3 Work Scope Development

NOTE: Work Scope Development, Job Hazard Analysis, and Work Package Preparation comprise an iterative process of preparing a safe Work Package. It is expected that portions of Sections 6.3 and 6.4 of this procedure and the JHA process (procedure PAS-2-1.4) will be performed simultaneously.

NOTE: The importance of developing a complete, detailed, and accurate scope of work cannot be underestimated, and sufficient time and resources must be allowed for this activity to be successful. In order for the hazards to be identified correctly and the work to be performed safely, the scope must be accurately described, bounded, and clearly communicated through the Work Packages to the Work Supervisors and workers.

Work scope development typically starts with a review of historical research compiled for the work activity. This includes historical information such as facility processes, potential contaminants of concern, significant features of the facility, waste streams entering the waste site, and/or previous characterization information.

Work scope development continues with a thoughtful analysis of the work to be performed, breaking down the work into discrete activities and breaking activities down into discrete work steps that can be analyzed for associated hazards. The level of detail used to define the scope may be more than what is actually included in the Task Instruction.

Documents that are needed to develop the scope of work and the Work Package may include (but are not limited to) the Authorization Basis, the HASP or other HCD, the air monitoring plan, the remedial action work plan, engineering design documents, drawings, etc.

6.3.1 The Work Control Planner shall develop the scope statement considering the following types of information:

- The purpose and type of activity or work being performed and the desired outcome
- Principal types of hazards directly involved or expected to be encountered, especially unique hazards (e.g., plasma arc cutting)
- Closely associated/located work activities, systems, or components that are not part of the scope
- Uncertainties that could affect the performance of the activity
- History of the activity performance, including records, process knowledge, etc.
- Lessons learned applicable to the work to be performed
- AB and environmental or regulatory impacts that could result from performance of the work or special techniques or tools that might challenge facility or site AB
- Any special techniques or tools that will be used that could introduce their own hazards.

6.3.2 The Work Control Planner shall provide the bounded work scope to the EPL.

6.3.3 The Work Control Planner prepares or coordinates the preparation of any necessary permits and ensures a PFWR is or has been processed for applicability of the *Davis-Bacon Act* as described in PAS-1-1.2.

NOTE: Attachment 2, Work Package Preparation and Reference Checklist, provides a list of references for many of the plans and permits.

6.3.4 The Work Control Planner checks the Lessons Learned database and feedback for items of interest related to the job scope. [10 CFR 851.21] The WCH Lessons Learned data base is located at <http://www.wch-rcc.com/sh/LESSONS/Lessons.htm>. The DOE Lessons Learned database is located at <http://www.hss.energy.gov/csa/Analysis/doell/index.asp>

NOTE: The WCH Lessons Learned Coordinator may be contacted for information regarding the DOE Lessons Learned Database.

- 6.3.5 The Work Control Planner and project and Planning Team members may conduct walkdowns of the work area throughout all phases of Work Package planning and preparation. Personnel participating in these walkdowns shall read and follow all relevant safety guidance (e.g., HCD) [10 CFR 851.A1]
- 6.3.6 The Work Control Planner prepares a draft Task Instruction (or the job task for a Craft Work Package) as an aid during the preliminary work planning and hazard analysis process.
- 6.3.7 The Planning Team conducts the JHA in accordance with PAS-2-1.4, "Job Hazard and What If Analysis."

6.4 Work Package Preparation

- 6.4.1 The Work Control Planner develops the Task Instructions, as described in Attachment 1 (the information in Attachment 1 is mandatory). Specific Task Instructions are created and tailored with input from the Planning Team.
- 6.4.2 The Work Control Planner ensures that potential single point failures that could lead to personnel injuries and all the controls from the JHA and "What If" Analysis are written into all Type I Work Packages.
- 6.4.3 If a portion of the work area is not accessible during the JHA, (e.g., area not accessible during the walkdown) a HOLD POINT shall be placed in the Work Package so that work cannot proceed in the inaccessible area. When the area becomes accessible, verification of the scope and an analysis of the hazards shall be conducted, the JHA and Work Package updated as required, and the HOLD POINT satisfied and signed.
- 6.4.4 Record the critical and intermittent resources required to perform activities in the Task Instructions in the sections or individual steps in the Task Instructions where they are required.
- 6.4.5 The Work Control Planner assembles the Work Package as described in Attachment 1.
- 6.4.6 The Work Control Planner completes the Work Package by attaching the appropriate permits and other documentation.
- 6.4.7 The Work Control Planner ensures that any hazard controls contained in attachments (e.g., excavation permit, cold and dark certification) are reflected in the JHA and Task Instructions.
- 6.4.8 The Work Control Planner ensures that the required PPE is clearly delineated in the Work Package. (PPE may be included on a PPE Checklist or by reference to a permit or plan in lieu of restating controls from the permit/plan in the work instructions.) The PPE Checklist (WCH-FS-243) shall be located in the Work Package if used.

- 6.4.9 The Work Control Planner coordinates the Work Package/JHA review and solicits comments from the Planning Team and others as the RM directs.

NOTE: A peer review of the Work Package and JHA is highly recommended but not mandatory. Review of the Work Package and JHA by craft is also desirable.

- 6.4.10 The Work Control Planner coordinates disposition of review comments.
- 6.4.11 The Work Control Planner performs a cross-check of hazard controls in both the Task Instruction and JHA to ensure that all controls in the JHA are brought forward and captured in the Task Instruction and that all unique controls in the Task Instruction are reflected in the JHA.

6.5 Work Package and JHA Approval

- 6.5.1 Upon completion of the JHA, the Planning Team signs the JHA to indicate that the appropriate controls have been identified (e.g., engineering controls, completed RWP) for the hazards associated with their area of expertise. [10 CFR 851.21 and A1] The Work Control Planner forwards the signed JHA to the RM.
- 6.5.2 Changes made to the JHA before the RM signs, but after some or all of the concurrence signatures are obtained, shall be reviewed with those who have already signed the JHA and they shall initial and date by their signatures or make an entry in the Work Package Status Log indicating continued concurrence.
- 6.5.3 The Work Control Planner obtains concurrence signatures as applicable. At a minimum, the Work Supervisor, PSR, and EPL shall sign each Work Package for concurrence.

NOTE: By signing their concurrence reviewers are signifying that they have read the Work Packages and agree that the work described in the package meets all technical requirements under their cognizance and that the package correctly incorporates the appropriate controls for the safe performance of the defined scope of work.

- 6.5.4 If changes are made to the Work Package after concurrence signatures are obtained but before the RM approves the Work Package, the Work Control Planner shall discuss the changes with the earlier reviewers and the reviewers shall either initial and date by their signatures or make an entry in the Work Package Status Log indicating continued concurrence.
- 6.5.5 If the Work Package will be used in or the work performed can affect a Hazard Category 2 or 3 nuclear facility, an Unreviewed Safety Question (USQ) review shall be performed in accordance with NS-1, *Nuclear Safety Manual*, NS-1-2.5, or in accordance with the facility owner's approved process. If the Work Package will be used in or the work performed can affect a facility with an FHC of Below Hazard Category 3, an evaluation shall be performed in accordance with NS-1-2.1, as applicable, or in accordance with the facility owner's approved process.

Integrated Work Control

- 6.5.6 If the work performed can affect the configuration baseline of a Hazard Category 2 or 3 nuclear facility, the Work Control Planner shall ensure that the appropriate System Engineer is aware of the work and updates the affected baseline documents as required.
- 6.5.7 If the RM directs, the Work Control Planner and Work Supervisor will coordinate a Work Package workability review. Guidance for this activity is contained on page 2 of form WCH-FS-260. The Work Control Planner will incorporate into the Work Package any changes resulting from the workability review as directed by the RM. If applicable, USQ and FHC reviews of the changes are required.
- 6.5.8 If the RM directs, a SMRT will evaluate the Work Package. The Work Control Planner will incorporate recommendations of the SMRT into the Work Package as directed by the RM. If applicable, USQ and FHC reviews of the changes are required.
- 6.5.9 The RM reviews and approves the JHA by signing the JHA cover sheet. The JHA form shall be maintained with the associated Work Package. [10 CFR 851.A1]
- 6.5.10 The RM reviews the completed JHA and Work Package to ensure that
- The Work Package is suitable for the scope,
 - Current references are incorporated,
 - All hazard controls from the JHA have been incorporated into Type I Task Instructions, or that the Craft Work Package JHA is suitable to protect the workers,
 - Any special controls (e.g., technical safety requirement [TSR], documented safety analysis [DSA], authorization agreement [AA]) are correctly and completely contained in the Work Package, and
 - The work will not defeat or compromise these hazard control strategies.
- 6.5.11 When satisfied that the work team will be properly directed and that all anticipated hazards have corresponding controls/mitigation in the Work Package, the RM approves the Work Package by signing the appropriate block on the cover sheet.

6.6 Work Package Implementation

- 6.6.1 Prior to authorizing work each day, the RM ensures that the approved Work Package can be used to safely and compliantly perform the work under the conditions prevailing on that day and with the resources available and that adjacent work activities will not be adversely impacted by the work.
- 6.6.2 The RM shall ensure that critical resources, as identified in the Work Package (or JHA for a Craft Work Package), are available to conduct or oversee the work.
- 6.6.3 The RM authorizes the work in writing on a daily basis.
- 6.6.4 If the Work Package is approved by the RM but not worked (inactive) for more than 60 days, prior to initiating or resuming work, the RM shall review the Work Package to:

- Determine if the consequences of delaying the work have had any detrimental effects on safety.
- Address potential changes to hazards and controls as a result of changed field conditions.
- Identify any newly identified lessons learned that should be integrated into the Work Package as appropriate

The RM shall document and sign this review in the Work Package Status Log (WPSL) (form WCH-FS-239).

Any changes to the Work Package resulting from this review shall be made per Section 6.9 of this procedure.

- 6.6.5 The RM reviews Work Packages open for one year or longer to determine if referenced forms and documents are current and the Work Package is still suitable for use. This review shall be documented and signed in the WPSL.
- 6.6.6 The Work Supervisor and the team performing the work should perform a work site walkdown prior to the first Pre-Ev or after any significant break in the activity. Workers new to the job should receive a brief and walkdown when they arrive.
- 6.6.7 The Work Supervisor conducts an interactive Pre-Ev daily prior to work commencement including a work site walkdown, as needed. The initial Pre-Ev for extensive or complex work should familiarize the crew members with the full scope of the Work Package. Each Pre-Ev shall be documented on a Pre-Evolution Briefing Checklist (form WCH-FS-210). [10 CFR 851.A1] Workers present shall sign the attached Pre-Ev roster for each brief.
- 6.6.8 The Work Supervisor releases the work by signing the Pre-Ev form [10 CFR 851.A1] indicating that all prerequisites have been met, all critical resources are available, and that the work team is ready to perform the work in accordance with the approved Work Package.

NOTE: When a Lockout/Tagout is installed as part of the prerequisites for work (i.e., prior to the Pre-Ev) or installed during previous work (e.g., yesterday), signing the Pre-Evolution Briefing Checklist (WCH-FS-210) authorizes work under the lockout/tagout.

6.6.9 Supervision requirements for Work Packages:

- When the supervisor is designated as a critical resource for a Work Package or an activity, that Work Package or work activity shall have dedicated supervision.
- When the supervisor is not designated as a critical resource for the Work Package or activity, that Work Package or work activity shall have intermittent supervision.

- 6.6.10 The Work Supervisor ensures work is performed in accordance with the approved Work Package. If work cannot be performed as written, the Work Supervisor contacts the RM to initiate the change process in accordance with Section 6.9.
- 6.6.11 Workers perform the work in accordance with the approved Work Package, being careful to observe the correct sequencing of work steps as prescribed.
- Work steps identified numerically shall be completed in order unless another order is stipulated in a note prior to the sequence.
 - Prefatory notes may also indicate other performance methods (e.g., "Sections 5.1 and 5.2 may be performed simultaneously").
- 6.6.12 If the Work Supervisor must turn over his/her duties to another Work Supervisor, the two Work Supervisors will discuss ongoing activities using the Pre-Ev as a guide and document the turnover in the WPSL(s).
- 6.6.13 The Work Supervisor ensures that Type I Work Packages are kept at the worksite and readily available to the workers, unless there is a reason not to (contamination, confined space, or environmental factors) as documented by the RM in the WPSL. In all cases, the information in the Work Packages should be readily available to the workers (e.g., workers in communication with someone who can read the work instructions to them).
- 6.6.14 If the Work Package is in an area where the original may be damaged or to provide for performing work in more than one area, an identical working copy of the original Work Package may also be used. The RM shall identify the number of working copies produced in the WPSL of the original Work Package and ensure that the words "WORKING COPY" are stamped or written on the cover of the working copies. The following apply:
- Changes made in the original Work Package shall be made in the working copies before they are used to control work.
 - If an entry (e.g., signature or data) is made in a working copy, the original should be updated as soon as possible, but no later than the end of the shift.
 - If work is conducted using more than one copy of the Work Package (e.g., using the original and copy in separate locations to conduct the same activities) and there is a question, problem, work suspension, etc., at one location, communication of the issue shall be made to the other work team(s).
 - When the working copy is no longer needed, the RM may have the copy destroyed after verifying that all data, including the WPSL, from the copy are transferred to the original and an entry made in the original Work Package WPSL that the working copy is no longer needed and has been destroyed.

6.7 Stopping and Restarting Work

NOTE: Stopping and restarting work is a normal part of performing the task. All workers are empowered to stop whenever conditions change or they are unsure of any aspect of the work. The supervisor may stop (take a time out, work pause, etc.) to discuss the job with the workers several times a day in the normal course of operations. It is important that supervisors understand that routine evaluation and discussion with the work team is expected to keep the operation safe, and that workers should be encouraged rather than discouraged from stopping work for appropriate reasons.

It is also important for the supervisor to know when the situation requires the notification of the RM to resolve issues. Steps 6.7.2 through 6.7.5 describe actions taken to address situations that must be solved at a higher level than the supervisor.

- 6.7.1 Workers and Supervisors must practice a questioning attitude and be sensitive to changed conditions to maintain a safe working environment. Examples of when to pause the work and reevaluate the work activity are:
- When a new tool or new equipment is introduced to the ongoing task,
 - When additional tasks not addressed in the scope of work or Pre-Ev must be performed to complete the work,
 - When performing similar tasks that may have different hazards, and
 - When environmental conditions change from the expected conditions.
- 6.7.2 Work Supervisors should implement the Observational Approach methodology in instances where the nature of the work is prone to unknowns and hazards are not readily apparent (e.g., Burial Ground Remediation). During work activities, stop work if: [10 CFR 851.A1]
- Additional work or work scope not identified in the package needs to be performed
 - A Work Package step cannot be performed as written (including sequence)
 - Following the Work Package will create an unsafe or noncompliant condition
 - An unexpected hazard or condition is encountered or hazard controls are determined to be inadequate.
- 6.7.3 When stopping work, workers shall place the component, system, or work area in a stable and safe condition, and immediately notify the Work Supervisor and RM. The STR shall be notified of all subcontractor stop work actions.

NOTE: When stopping work, workers should not attempt to remedy changed conditions or fix problems beyond the minimum required to place the component, system, or work area in a stable and safe condition.

- 6.7.4 The Work Supervisor and/or RM shall make an entry in the WPSL to document stopping the work including the reason.
- 6.7.5 Assess the situation and prepare to restart work as follows:
1. The RM shall notify (as appropriate) SMEs, managers, and their director to help assess new hazards and/or changed conditions.
 2. The RM and (as appropriate) SMEs, managers, and director will determine measures necessary to safely restart work.
 3. The Work Supervisor and/or RM will initiate appropriate changes to Work Packages and/or work areas to resolve the issue(s). Subcontractors will coordinate all such changes through the STR. [10 CFR 851.A1]
- 6.7.6 Work Supervisor and RM reinitiate work activities after issues have been resolved, the work documents have been revised (if required), and the workers have been briefed on the resolution. A WPSL entry shall be made.

6.8 Feedback

Feedback is one of the ISMS core functions that helps improve the operations of the RCCC. Feedback should be submitted anytime there is something to be learned from evaluating RCCC activities – good or bad – and when that information should be shared across the project. The best time to document an evaluation of an activity is when it happens. An excellent source of feedback is the Pre-Ev brief or morning meeting. Everyone is encouraged to evaluate RCCC operations and provide information that will improve RCCC safety and productivity.

The completed feedback forms, either paper copy (form WCH-FS-235) or electronically submitted (via the WCH Intranet - Web Tools - IWCP Feedback), are forwarded to the IWC Program Administrator. The IWC Program Administrator will evaluate the feedback and post relevant portions for the Work Control Planners and/or distribute as necessary and appropriate.

The IWCP Feedback Database, also available through the WCH Intranet - Web Tools - IWCP Feedback, is word searchable to assist Planners and Supervisors.

6.9 Changes to Work Packages and JHAs

The responsibility for determining whether changes are major or minor lies with the RM. The JHA shall be reviewed for adequacy whenever there is a change in scope, work area conditions, identification of new hazards, or a regulatory or procedure change that affects the Work Package. Whenever a Work Package is changed, the JHA is reviewed by the RM, PSR, and applicable SMEs (as determined by the RM), for adequacy. [10 CFR 851.21] The RM will determine if/when a Work Package will be changed, revised, or a new **Work Package will be written.**

6.9.1 Minor Changes

Minor changes made to approved Work Packages and/or JHA shall be concurred with by the Work Supervisor and PSR and approved by the RM. For Category 2 or 3 nuclear facilities, the changes shall also receive a USQ review.

To document a minor change, perform the following actions:

1. Add additional text and/or draw a single line through the Work Package and/or JHA text to be changed.
2. Insert a bar (vertical line) in the margin of the page and initial/date the bar to signify where the change was made.
3. All changes shall be described and documented on the WPSL and signed and dated by the person making the changes.
4. Concurrence from the Work Supervisor and PSR and approval by the RM shall be documented by signatures on the WPSL.

6.9.2 Major Changes

Major changes made to approved Work Packages and/or JHAs shall be concurred with by the Work Supervisor responsible for the work, the PSR, and other SMEs as directed by the RM, and approved by the RM.

To document a major change, perform the following actions:

1. Add additional text and/or draw a single line through existing Work Package and/or JHA text to be changed.
2. Insert a bar (vertical line) in the margin of the page with initial/date on the bar to signify where the change was made.
3. All changes shall be described on the WPSL and signed and dated by the person making the changes.
4. For all major changes the hazards and controls shall be re-evaluated. Additional hazards/controls shall be incorporated into the JHA/Work Package.
5. For Category 2 or 3 nuclear facilities, the Work Package changes shall receive a USQ review.
6. For nuclear facilities with an FHC of below Hazard Category 3, performance of an FHC evaluation shall be considered. An FHC evaluation is required for changes that could (1) affect a preservation control required to ensure the FHC assumptions remain valid, (2) introduce a new hazard, or (3) require the implementation of a new preservation control in the AB.
7. The Work Supervisor, PSR, and SMEs (assigned by the RM) shall sign the WPSL indicating concurrence with the changes and the RM shall sign the WPSL for approval.

6.9.3 Additional Major Change Guidance

1. As an alternative to a traditional pen-and-ink change, a computer-generated change (also following Major Change rules) may be performed as follows:
 - a. Strike through the text to be changed.
 - b. Make the desired entry into the Work Package and/or JHA.
 - c. Underline the change and replace the page.
 - d. Initial and date next to a vertical line drawn in the margin next to the change.
 - e. Mark removed page(s) as SUPERSEDED, document in the Miscellaneous/Field Generated Paperwork Record (WCH-FS-240), and place them behind the Miscellaneous/Field Generated Paperwork Record or in the history file.
2. Changes requiring page replacements or additions may be made as follows:
 - a. Generate new page(s) with vertical line in the margin next to the change.
 - b. Replace original page(s) with changed page(s).
 - c. Insert additional page(s), as required.
 - d. Initial and date the changed page.
 - e. Mark removed page(s) as SUPERSEDED, document in the Miscellaneous/Field Generated Paperwork Record (form WCH-FS-240), and place them behind the Miscellaneous/Field Generated Paperwork Record or in the history file.
3. For superseded pages that contain signatures or initials on steps that do not have to be repeated, indicate on the changed page that the original signatures/initials are located on the superseded pages behind the Miscellaneous/Field Generated Paperwork Record (form WCH-FS-240).

6.10 Revisions to Work Packages

A Work Package may be revised by the Work Control Planner at the request of the RM. A revision to a Work Package is performed as follows:

- 6.10.1 Sections 6.3, 6.4, and 6.5 of this procedure shall be re-performed. In all cases a JHA shall be re-performed in accordance with PAS-2-1.4, and concurrence signatures obtained for all Planning Team members.
- 6.10.2 For Category 2 or 3 nuclear facilities, the changes shall receive a USQ review.
- 6.10.3 An FHC evaluation is required for any revision that could (1) affect a preservation control required to ensure the FHC assumptions remain valid, (2) introduce a new hazard, or (3) require the implementation of a new preservation control in the AB.

6.10.4 All pages of the Task Instruction, and the JHA, shall be marked with the next revision number.

6.10.5 The cover sheet of the Work Package shall be marked with the next revision number and concurrence signatures obtained from Planning Team members identified by the RM.

6.11 Post-Job Review

6.11.1 The Work Supervisor should conduct a post-job review for any job for which constructive feedback can be obtained. Examples are:

- An injury occurred
- A significant improvement in work performance or work methods is identified
- At the request of the RM
- Any time other significant information needs to be captured to prevent problems or improve future work activities.

6.11.2 The Work Supervisor notifies the Work Control Planner of the date, time, and location of the post-job review. The Work Control Planner attends the post-job review and documents relevant information on the IWCP Feedback Checklist, using either paper copy (form WCH-FS-235) or electronic format (WCH Intranet - Web Tools - IWCP Feedback). The review should include as many of the work crew that can attend and SMEs who provided significant task support.

6.11.3 The completed feedback forms are forwarded to the IWC Program Administrator.

6.12 Work Package Completion

6.12.1 The Work Supervisor checks the Work Package for accuracy and completeness, provides closure recommendation at completion of work by signature on Work Package cover sheet, and forwards the Work Package to the Work Control Planner.

6.12.2 The Work Control Planner ensures that all required signatures have been obtained and that all Pre-Ev forms and other history file materials are integrated into the package. The Work Control Planner then forwards the completed Work Package to the Project Engineer (or designee).

6.12.3 The Work Control Planner should provide feedback, using either the paper copy (form WCH-FS-235) or electronic format, including any information that may be useful to planning of future work.

6.12.4 The Project Engineer (or designee) will ensure that as-left conditions are documented for future reference, including use by other projects. For example, documenting locations of buried structures and utilities (both active and inactive) that remain after demobilization or backfill. As needed, the Project Engineer can contact Engineering Services for guidance and support on as-built documentation.

6.12.5 For work in a Hazard Category 2 or 3 nuclear facility, the System Engineer shall ensure any required updates the affected baseline documents have been completed.

6.12.6 The Project Engineer (or designee) forwards the Work Package to the RM.

6.12.7 The RM reviews the Work Package for completeness, signs, and returns the package to the Work Control Planner for closure.

6.13 Work Package Closure

The Work Control Planner coordinates closure in the work tracking log or work control system and archives the Work Package with Document Control. The Work Package is removed from the three-ring binder (if applicable) and placed in a file folder (see Document Control for type). The Work Package record cover sheet (DOCS Open 706875) is filled out and attached to the file folder and the folder sent or hand carried to Document Control.

Work packages may be discarded if no field work has been performed. The RM will evaluate the Work Package for future use and, if the package is not suitable, will instruct the Work Control Planner to dispose of the package.

If field work has been performed and the Work Package will not be completed, the RM shall evaluate the impact of terminating the activity. The RM will make an entry in the WPSL explaining why the Work Package will not be completed, and instruct the Work Supervisor to begin completion and closure of the Work Package in accordance with Sections 6.12 and 6.13.

7.0 RECORDS

Work packages generated by this procedure shall be submitted to Document Control in accordance with the established Records Inventory and Disposition Schedule (RIDS) in BSC-1, *Business Services and Communications*, BSC-1-7.8, "Records Management."

8.0 JUSTIFICATION SUMMARY

Revision	Reason for Revision
5	Complete rewrite
4	The procedure was revised to add lockout/tagout clarification, adjust for cancellation of PAS-2-3.2, "Work Re-Start Guidance", acknowledge the use of the electronic feedback system and make other minor clarifications.

9.0 REFERENCES

10 CFR 851, *Code of Federal Regulations*, as amended.

BSC-1, *Business Services and Communications*, Washington Closure Hanford, Richland, Washington.

BSC-1-7.8, "Records Management"

BSC-1-8.6, "Obtaining Services from Other Hanford Site Contractors"

ENG-1, *Engineering Services*, Washington Closure Hanford, Richland, Washington.

ENG-1-1.1, "Engineering Services Overview"

ENG-1-3.3, "Configuration Management"

NS-1, *Nuclear Safety Manual*, Washington Closure Hanford, Richland, Washington.

NS-1-2.1, "Hazard Categorization"

NS-1-2.5, "Unreviewed Safety Question Process for Hazard Category 1, 2, or 3 Nuclear Facilities"

PAS-1, *Project Activities and Support*, Washington Closure Hanford, Richland, Washington.

PAS-1-1.1, "Technical Procedure Development"

PAS-1-1.2, "Plant Forces Work Review and Turndown Process (Davis Bacon Act Compliance)"

PAS-2, *Integrated Work Control Program*, Washington Closure Hanford, Richland, Washington.

PAS-2-1.2, "Preventive Maintenance"

PAS-2-1.4, "Job Hazard and What If Analysis"

WCH-4, *Integrated Environment, Safety, and Health Management System Description*, Washington Closure Hanford, Richland, Washington.

10.0 FORMS

WCH-FS-210, Pre-Evolution Briefing Checklist

WCH-FS-229, Work Process Form

WCH-FS-233, Job Hazard Analysis

WCH-FS-235, IWCP Feedback Checklist

WCH-FS-236, WCH Work Package Cover Sheet

WCH-FS-237, Craft Work Package

WCH-FS-238, Emergency Work Documentation

WCH-FS-239, Work Package Status Log

WCH-FS-240, Miscellaneous and Field-Generated Paperwork Record

WCH-FS-243, Personal Protective Equipment Checklist

WCH-FS-260, Work Package Workability Review

11.0 ATTACHMENTS

1. Work Package Preparation, Formatting, and Use
2. Work Package Checklist

Attachment 1: Work Package Preparation, Formatting, and Use

1.0 CRAFT WORK PACKAGE

A Craft Work Package (CWP) is used when the activity is considered skill of the craft (craft means the worker whether represented or exempt). Skill-of-the-craft activities are those that the worker is trained to perform and pose minimal risk to the individual or others.

The Craft Package is a relatively simple, straightforward document providing workers with a hazard analysis for the activity they are to perform. The CWP is prepared on form WCH-FS-237. JHAs for CWPs are developed in accordance with PAS-2-1.4, "Job Hazard and What If Analysis." JHA controls are not incorporated into the CWP.

Additional guidance may be provided to the worker to perform the activity. This guidance is intended to be simple and should not take the form of a procedure. For example, a waste SME may provide alternatives to covering outdoor staged waste forms prior to packaging, or an engineer may provide guidance on lifting locations for a non-critical lift. The guidance may also be an attached schematic (e.g., electrical service fabrication) or a map (e.g., install a temporary fence) or other diagram.

Craft Work Packages shall not contain sequential steps, hold points, sign offs, etc. If step-by-step instruction must be given to the worker to ensure proper performance of the job, then a CWP is not appropriate for the task.

Craft Work Packages may remain open and used multiple times for the same scope of work. Each time the Craft Work Package is used, the RM reviews the Work Package and associated JHA for changes that may affect the planning, hazards, or controls. The RM ensures necessary changes are made to the Work Package, JHA, or other affected documents in accordance with Section 6.9.

1.1 Preparing the Craft Work Package

The Work Control Planner:

- Prepares a job description/scope of work that accurately describes the activity.
- Facilitates a JHA for the activity in accordance with PAS-2-1.4 and attaches it to the Craft Work Package.
- Fills in the required information on the CWP form.
- Checks YES or NO in the appropriate check boxes for permits, plans, certifications, or additional documentation that provide job-specific hazard controls for the activity or are required to perform the work.
- Attaches a copy of the permit and/or records the permit number.
- Adds any additional comments.

- Records any utilities that are in service in the work area.
- Records any precautions, limitations, comments, and/or special tools/equipment needed to safely perform the activity.
- Provides any prerequisites needed to start the work.
- Provides any additional information.
- Attaches other required documents to the Work Package.
- Fills in the detailed work scope block on the Performance page (if known).

On the cover page, the Planner signs and obtains concurrence signatures from members of the Planning Team as determined by the RM. At a minimum, the Work Supervisor, Project Safety Representative (PSR), and Environmental Project Lead (EPL) shall sign each Work Package for concurrence.

The Project Engineer (or designee) determines whether a USQ screening or FHC evaluation will be performed and, if necessary, the CWP is submitted for the proper review. The RM approves the Work Package based on personal review and these concurrences.

1.2 Using the Craft Work Package

The RM ensures that the scope of work is safe to perform and authorizes the work. The Work Supervisor conducts a Pre-Ev Briefing and files the form in the Work Package. The Work Supervisor briefs the workers on the hazard controls found in the JHA as part of the Pre-Ev.

When a lockout/tagout is to be performed as part of the work process (i.e., after the pre-evolution brief is conducted), an entry in the Performance page or Work Package status log shall be made stating that the lockout/tagout has been properly implemented and work may proceed. This entry shall be signed by the Work Supervisor and authorizes work under the lockout/tagout.

The Work Supervisor records work performed and other relevant information on the Performance page (continuation on WPSL). When the scope of work is complete, the Work Supervisor signs the bottom of the page indicating that the scope of the Performance page (not the CWP) is complete. The completed Performance page may be retained in the Work Package or placed in the CWP history file.

CWP completion and closure is performed in accordance with Sections 6.12 and 6.13.

Craft Work Packages may be used multiple times for the same scope of work, and have multiple Performance pages. A new Performance page is prepared by the Work Supervisor and approved by the RM to provide direction for each specific application of the CWP. When preparing a new Performance page, the JHA and Work Definition pages are checked for applicability and changed in accordance with Section 6.9, as required. Each use of the CWP is authorized by RM signature of the Plan of the Day (or other work authorization document).

2.0 TYPE I WORK PACKAGES

Type I Work Packages are used when a set of detailed or step-by-step work instructions are necessary to accomplish tasks. A JHA for the scope of work covered by the Type I Work Package is conducted in accordance with PAS-2-1.4. The hazard controls from the JHA shall be incorporated into the Type I Task Instructions.

Type I Work Packages are developed for a single use and are prepared using a graded approach. The degree of risk and complexity will drive the detail in the package.

2.1 Type I Formats

Task Instruction Header

The Task Instructions (TIs) will use headers similar to the example presented below. The following information should be included in the header, as applicable: company; the Work Package number; current TI revision number; a short descriptive title of the work to be performed; and the Work Package page number (e.g., Page 1 of 10).

EXAMPLE – Task Instruction Header

WCH Task Instruction	Work Package No.	100 06 02 26 001	Rev.	0
Title	Page	1 of 10		

Work Package Section Numbering and Content

Use the format below to build and arrange the Work Package. (Recommendation: Use a three-ring binder with tabs to make the information in the Work Package easy to find.)

- Section 1 Work Package Cover Sheet
- Section 2 Table of Contents
- Section 3 Task Instructions (including the following sections)
 - 1.0 PURPOSE AND SCOPE
 - 2.0 PRECAUTIONS/LIMITATIONS
 - 3.0 PREREQUISITES
 - 4.0 EQUIPMENT/MATERIALS
 - 5.0 PROCEDURE
- Section 4 Work Package Attachments
- Section 5 Miscellaneous and Field Generated Paperwork Record
- Appendix 1 Job Hazard Analysis
- Appendix 2 Work Package Status Log
- Appendix 3 Pre-Evolution Briefing

The above sections shall appear in every Type I Work Package. When there is no text necessary, the word "None" is used to indicate that the author gave consideration to all parts of the Work Package. To support the Work Package, a history file may be used to hold superseded revisions, superseded drawings, Pre-Ev forms, etc.

Section 1: Work Package Cover Sheet

The completed Work Package Cover Sheet (WCH-FS-236) is located in Section 1 of the Work Package. The Work Control Planner completes a Work Package Cover Sheet (WCH-FS-236) and adds the required persons or organizations to review and concur with the package based upon RM direction.

Section 2: Table of Contents

The Table of Contents includes the required sections and appendix headings as they appear in the Work Package.

Section 3: Task Instructions

The TI is prepared in accordance with this attachment, Section 3.0. The Work Package Reference Checklist (Attachment 2) may be used as a guide for the Work Control Planner in preparing Work Packages.

Section 4: Work Package Attachments

Attachments are used to clarify or support the TI and may include maps, drawings, specifications, manufacturer's instructions, hoisting and rigging plans, and/or other waste management instructions, etc.

Section 5: Miscellaneous and Field Generated Paperwork Record

Place the Miscellaneous and Field-Generated Paperwork Record (WCH-FS-240) in this section. The Miscellaneous and Field Generated Paperwork Record is used to record permits and plans (e.g., Beryllium or Lead Work Plans) associated with the Work Package or to store superseded pages.

EXAMPLE – Miscellaneous and Field Generated Paperwork Record

Miscellaneous and Field Generated Paperwork Record

Doc #	DESCRIPTION	PAGES
1	Work Process Form	1
2	Superseded JHA dated 7/14/07	5
3	Electrical Field Sketch – FSK-4301-U	2
4	Job Hazard Identification Work Sheet (WCH-FS-231)	1

Appendix 1: Job Hazard Analysis

This appendix contains the completed JHA.

Appendix 2: Work Package Status Log

The Work Package Status Log (WCH-FS-239) is placed here. The WPSL is used by the Work Supervisor and RM to document issues, events, and off-normal conditions and to document changes to the Work Package. The WPSL is used to document transfer of responsibility between Work Supervisors, and other information pertinent to the work that should be communicated to subsequent shifts. Beyond that, the WPSL can serve as a useful summary level chronology of work performed, including the documentation of issues, incidents, injuries, work stoppage, etc.

Appendix 3: Pre-Evolution Briefing

This appendix is where the Work Supervisor files the completed Pre-Evolution briefings. Typically, a week of Pre-Evolution briefing forms is kept in the package. All Pre-Evolution briefings shall be kept so that they may be attached to the Work Package during archiving but may be filed until closure in the Work Package history file.

3.0 PREPARING TYPE I WORK PACKAGES

Work packages are developed using a graded approach, incorporating as many components as necessary to accomplish the task(s). The risk and complexity levels of the work will dictate the content of the Work Package. The determination of Work Package content rests with the Work Control Planner, with input from SMEs and the RM.

Work packages are written for the Work Supervisors and workers. Work packages incorporate technical, quality, environmental compliance, AB, and safety requirements into directions for conducting work activities.

3.1 Purpose and Scope

- a. a. Provide a clear and concise description in the **purpose** of the intent/goal to be achieved.

EXAMPLE – Purpose Statement

1.1 PURPOSE

This Work Package provides instructions for Class I asbestos abatement in Building 333.

- b. The scope statement should address the major task(s) to be performed, including defining general boundaries, major activities, and special processes and techniques. If applicable, systems, structures, and components excluded from the scope may also be identified.

EXAMPLE – Scope Statement**1.2 SCOPE**

This Work Package addresses the actions necessary to remove Class I (friable) asbestos using several methods. It does not include alternate removal methods as defined in 29CFR1926.1101.

3.2 Precautions and Limitations

Precaution/limitation statements identify hazards or work restrictions that affect the entire TI; occur at more than one point in the TI; and/or caution the user on personal safety, equipment safety, special-condition approval requirements, improper actions that could adversely affect results, etc. Contrary to the convention in the procedure section of the TI, precautions and limitations are presented as numbered items in the Work Package so they may be referenced where necessary.

- a. Do not present user actions in the precautions and limitations section. If action is required by users to respond to the precaution or limitation, provide action steps at the appropriate location in the TI.
- b. Identify and address the protection of equipment and material.
- c. The Precautions and Limitations Section delineates hazards/controls that affect the entire Work Package.

EXAMPLE – General Precaution Statement

2.2 Water levels in the river may change suddenly, potentially stranding watercraft.

d. Precautions:

- Alert Work Package users to actions and conditions that represent potential hazards to personnel or possible damage to equipment
- Identify abnormal conditions.

EXAMPLE – Precaution Statement

2.3 Switchgear bus stabs, contacts, and auxiliary devices may remain energized even when line-side power is disconnected.

- e. **Limitations** define boundaries that are not to be exceeded. Limitations inform the user that conditions exist which may affect the implementation of the Work Package and include such items as design limits, administrative controls, or equipment limits.

- **EXAMPLE - Limitations** -
-

- **2.7•** Two 2500 gpm fire pumps shall be in service at all times.

3.3 Prerequisites

This section identifies equipment or system conditions and pre-task steps, which shall be satisfied prior to performing the procedure section of the TI. Prerequisites are presented as numbered items in the Work Package. Prerequisites shall not direct the performance of field work activities.

- a. The prerequisites section includes information on activities that must be undertaken to plan and coordinate the performance of the work. These actions may include, but are not limited to, the following:
- Training requirements or qualifications specific to the work.
 - Verifying system conditions required to perform the work.
- b. Provide instructions for preparatory field activities that shall be completed before continuing with the TI. Examples of these activities are listed below.
- Lock-out/tag-out of equipment
 - Completion of a Cold and Dark Checklist
 - Obtaining required permits such as radiation work, electrical work, or confined space work permits. Ensure appropriate signoffs and approvals are obtained.
- c. Identify any approvals and notifications that shall occur before the actions in the TI begin. Approvals and notifications related to specific action steps in the TI are placed adjacent to the affected action step.
- d. Verification sign-off points may be appropriate for prerequisites that affect safety, environmental/regulatory compliance, radiological conditions, quality, or other conditions. Verification of prerequisites generally occurs when the Work Supervisor signs the Pre-Ev briefing form.

3.4 Equipment/Materials Section

Equipment/Material Requirements

- a. Provide a list of the necessary equipment and materials needed to perform the task(s). Do not include common items such as pencils, pens, paper, forms, data sheets, or common tools-of-the-trade, etc.

- b. If measuring and testing equipment (M&TE) is prescribed, specify the operating limit or range, and provide space to record the M&TE number and calibration information. Provide space to record the M&TE number and calibration due date information at the point in the TIs where M&TE will be used.

EXAMPLE – M&TE

4.7 Torque wrench, range: 0 – 100 ft. lb., calibration: annual,

Torque wrench number: _____ Range: _____ Cal Date: _____

3.5 Procedure

3.5.1 General

- Only the Work Supervisor gives direction on the job. The RCT, engineer, EPL, etc., may advise the supervisor, but it is the supervisor that directs action. Do not undermine this authority by using statements such as “at the direction of the engineer.”
- The word “shall” identifies those mandatory requirements or actions, unless prior written justification and management approval of an alternate approach is obtained. The word “should” indicates a recommendation that is based on standards and good safety and business practices. The word “may” indicates when permission is granted, but the action is neither a recommendation nor a requirement. “May” statements often provide a suggested or possible course of action when a consistent methodology is not required.
- The word “verify” means to sign something to indicate that an action was performed. The word “ensure” means that the supervisor needs to make sure that the task is complete, but does not require a signature.
- All hazard controls from the JHA (WCH-FS-233), including the “What If Analysis,” shall be incorporated into Type I Work Packages. The Craft Work Package hazards and mitigations are intended to be briefed directly from the JHA.
- The procedure section includes a logical sequence of action steps that are performed to complete the tasks. Applicable acceptance criteria shall be included where appropriate. Where appropriate, include note, caution, and warning statements that are specifically applicable to a step or sequence of steps.
- When a lockout/tagout is to be performed as part of the work process (i.e., after the Pre-Evolution Briefing is conducted), a hold point in the Work Package shall be incorporated stating that the lockout/tagout has been properly implemented and work may proceed. This entry shall be signed by the Work Supervisor and authorizes work under the lockout/tagout
- A reference to preparing a lockout/tagout is appropriate (e.g., Lock and tag the feeder breaker to the EF-7 fan...). Non-specific referencing of a procedure that contains many controls (e.g., Use proper controls for overhead electrical lines per PAS-1-2.3, “WCH

Electrical Safety Program”) is not specific enough. A specific reference to the section or step in this case is appropriate.

- Incorporate specific requirements (e.g., radiological, nuclear safety, health and safety, lock and tag, inspection, environmental or regulatory compliance requirements, hold points, surveillance requirements, post-work testing requirements, return to service requirements) as identified by the respective disciplines.
- If the work will affect the design, function, or method of performing the function of a system, structure, or component, impact a Technical Safety Requirement (TSR) or a preservation control described in the AB, then the Project Engineer and RM, in conjunction with facility operations, determine the specific actions and reference the applicable design change notice, AB document, or DOE-approved compensatory actions. The Work Control Planner incorporates the necessary actions into the Work Package as identified by the team.
- PPE selection may be included in the Work Package in a number of ways, but shall be called out prior to the Work Package approval.
 - If the PPE is known and will not change, it is appropriate to specify it in the JHA and steps in the Work Package where it will be used.
 - Individual plans and permits prescribing PPE including RWP, BWP, Confined Space, etc., may be referenced.
 - If PPE is prescribed by more than one entity, permit, plan, etc., a PPE Checklist shall be prepared to ensure that the workers know what PPE they are to wear.
 - When required, an initial PPE Checklist shall be prepared to prescribe the PPE for the job. This initial PPE Checklist is located in the Miscellaneous and Field Generated Paperwork Record (Section 5). When the PPE requirements change, a new PPE Checklist is prepared as a Work Package change in accordance with Section 6.9, “Changes to Work Packages and JHAs.” Superseded PPE Checklists are conspicuously marked with a corner to corner diagonal line with the word “superseded” and replaced in the Miscellaneous and Field Generated Paperwork Record.
- PPE selection prescribed by the SME(s) shall be evaluated for potential conflict and any conflict resolved. (This includes each PPE Checklist prepared for the work.) Each SME prescribing PPE shall sign the PPE Checklist (when required).
- If numbered TI steps can be worked in any order other than sequentially, the Work Control Planner includes a NOTE in the TIs at the beginning of the section explaining how the steps are to be followed (e.g., “Steps in this section may be worked concurrently or in any order except steps 14 through 18, which shall be worked in the order listed.”).
- Place keepers may be inserted as an aid to the Work Supervisor to show where a step or section has been completed. Place keepers should be clearly visible and may be in the margin by the step number as lines for the supervisor to initial or boxes to check off or may be a signature for the step below the step.

- Incorporate input from the Lessons Learned database and feedback as appropriate.
- On occasion it may be necessary within a Work Package to require performance of a procedure or other Work Package. If the referenced procedure or Work Package has been prepared and approved in accordance with PAS-1-1.1 or PAS-2-1.1, then it may be performed as written. If not, then incorporate the applicable text of the other document into the Work Package or include the entire document in the Work Package as an attachment. The incorporated or attached text will be analyzed in the JHA for the Work Package and hazard controls associated with incorporated or attached text shall be added where appropriate.
- When required or allowed by the terms of the subcontract, a Vendor or Subcontractor may use and include in the Work Package their own procedures or plans (including test plans) as enclosures in the format of their choice, providing that the procedure or plan has been reviewed and accepted by the project, and evaluated through the JHA process with relevant controls included in the Work Package, and procedure or plan. Implementation shall follow the same disciplined approach that applies to the Work Package under IWCP.
- When preparing the Work Package TI, the Work Control Planner is responsible to:
 - Ensure that the content of the TI is technically and administratively accurate.
 - Ensure that the TI format is in accordance with the requirements of this procedure.
 - Ensure that definitions used in the TI are appropriate, and acronyms are clearly defined.
 - Write TIs to provide direction with sufficient, but not excessive, detail to perform the required functions without direct supervision. The extent of the detail should depend on the complexity of the task, the experience and training of the user(s), the frequency of performance, and the significance of error consequences.
 - Ensure that applicable acceptance criteria are included and adequate restoration and retest, including post-maintenance tests and operational functional testing to prove operability, is included.
 - Ensure that decision making required in Task Instructions is consistent with the user's qualifications and level of authority.
 - Ensure that TIs are developed with consideration for the human-factor aspects of their intended use.
 - Steps should be limited to one action and written in a clear, concise manner.
 - References to components should match drawing or label-plate identifiers, units should be the same as those marked on applicable instrumentation, and charts and graphs should be easily read and interpreted.

- Eliminate unneeded “boilerplate” material such as a statement to use battery powered tools in wet environments if the package doesn’t call for work in wet environments.
- Ensure that the TI does not place personnel, equipment, or the environment in a condition that is unsafe or unanalyzed, either during the performance of the work or at final configuration, after the work has been completed.

3.5.2 “Step by Step” Structure

- a. Structure is very important in the procedure section of the TI. Break up the task into logical areas (generally by time of performance).
- b. Avoid, if possible, referencing other Work Packages or situations where the user must flip back and forth between pages.
- c. Repetitive instructions are used when repeated adjustments or tasks are required.
- d. If instructions can be rewritten rather than referenced without greatly increasing the length of the TI, they should be rewritten.
- e. DO NOT reference “reverse performance” of steps.

3.5.3 Headings for Work Steps

Headings break the text of the TI into sections by grouping related action steps. Section headings help users locate information in the TI, break up long series of actions into manageable chunks, and track their progress through the work. Give each major activity in the main body of the TI a unique and descriptive heading. Follow the example below:

EXAMPLE – Headings

5.0 FIRST LEVEL HEADING (Bold)

5.1 Second-Level Heading (Bold)

5.1.1 Third-Level Heading (Bold) or first level action step (not bold)

A, 1, I. First-level action step

B, 2, II. First-level action step with two second-level action steps

(1, a) Second-level action step

[1, a] Third-level action step (specific order)

- a. If second-level headings organize activities, start the headings with the "ing" form of action verbs and complete the headings with the objects of the action verbs (for example, **Starting Cooling Water Pumps**).
- b. Action steps involving three or more related resultant action statements that require sequential performance are arranged as a prioritized list.
- c. All Steps shall be numbered. If the sequence may be performed in another order, a note shall be used to specify the sequence.

3.5.4 Special Grammar

- a. Instructional action statements begin with an action verb.
- b. Conditional statements are in "IF, THEN" format, whenever possible, stating first the condition to be satisfied, and then the action to be taken:
- c. Avoid excessive use of word-processing emphasis such as **BOLD**, UNDERLINE, *ITALICS*, all CAPITAL letters or combinations.

3.5.5 Note, Caution, and Warning Statements

- a. Notes are used to present descriptive or explanatory information intended to aid the users to perform steps.
- b. Cautions are used to alert users of potential hazards to equipment/structures.
- c. Warnings are used to alert users of potential hazards to personnel.
- d. Notes, cautions, and warnings shall NOT contain action statements.
- e. All warnings and cautions are placed ahead of and on the same page as the affected step, steps, or section to which they apply and are emphasized with borders as follows:

<p>CAUTION Operation of the pump at greater than 50 psig discharge pressure may damage the filter.</p>

<p>WARNING Energized 480 volt components are located inside this panel.</p>
--

- f. The step immediately following the warning or caution box and prior to the step where the hazard will be encountered shall contain the controls for the hazard described in the box.

3.5.10 Post-Performance Activities

- a. The Work Package can detail system retest requirements.
- b. Proof or post-maintenance testing may be required.
- c. Provide any equipment/system restoration requirements.

3.5.11 Appendices

- a. Appendices are listed in the table of contents, as applicable.
- b. Appendices may be presented in portrait or landscape format, as required.

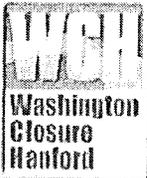
4.0 Emergency Work Documentation

Emergency work shall be authorized by the RM when actions must be immediately taken to prevent injury/damage to personnel, property, or the environment. Use form WCH-FS-238 to document notifications and actions taken during the emergency.

Attachment 2: Work Package Reference Checklist

References:

- Identify PFWR or submit in accordance with (IAW) **PAS-1-1.2**
- Request Cold and Dark Certification, if required, IAW **PAS-2-1.3**
- Check for categorical NEPA exclusion or submit NEPA review for non-CERCLA work IAW **ENV-1-1.12**
- Ensure a Cultural/Ecological Resources Review is completed, if required, using form **WCH-EE-106**
- Check current HASP, or other HCD if prepared. Request Project Safety Representative to prepare or revise as necessary (reference **SH-1-6.1**)
- Prepare a Lockout/Tagout IAW Hanford Site Lock and Tag Procedure (DOE-0336)
- Schedule an Asbestos Inspection, if required, IAW **SH-1-4.7**
- Request a rigging plan, if required, IAW **DOE/RL-92-36**
- Request Plans and Permits to be prepared as necessary to support work which include, but are not limited to:
 - Excavation Permit IAW **PAS-1-2.1**
 - Concrete Coring Permit IAW **PAS-1-2.9**
 - Non-Emergency Hydrant Tie-In Permit IAW **PAS-1-2.12**
 - Energized Electrical Work Permit IAW **PAS-1-2.3**
 - Fall Protection Plan IAW **SH-1-3.5**
 - Confined Space Entry Permit IAW **SH-1-3.7**
 - Scaffolding Safety Checklist IAW **SH-1-3.16**
 - Lead Work Plan IAW **SH-1-4.8**
 - Beryllium Work Plan IAW **SH-1-4.9**
 - Hot Work Permit IAW **SH-1-5.13**
- Perform and document a building condition engineering survey for all building demolition IAW **SH-1-3.18**
- Contact the Waste Transportation Specialist for preparation Site Specific Waste Management Instruction (SSWMI) IAW **WMT-1-1.9**
- Coordinate ordering materials and track progress IAW **ENG-1-6.1**
- Determine the need for an NEC inspection IAW **PAS-1-2.7**
- Access the Lessons Learned data base and check for job related information IAW **PAS-1-1.8** (link to LL web page: <http://www.wch-rcc.com/sh/LESSONS/Lessons.htm>) or DOE LL at <http://www.hss.energy.gov/csa/Analysis/doell/index.asp>
- Obtain MSDSs as applicable for the products used on the job IAW **SH-1-4.16**
- Prepare or obtain historical information, drawings, sketches, plans, or other information to support JHA and Work Package development

		WASHINGTON CLOSURE HANFORD LLC SUBCONTRACT MODIFICATION	
DATE:	08/23/2010	CONTRACTOR:	Washington Closure Hanford LLC 2620 Fermi Avenue Richland, Washington 99354
SUBCONTRACTOR:	Envirotech Eng. & Consulting Inc.	EFFECTIVE DATE:	08/23/2010
ADDRESS:	2500 N 11th St. Enid, OK 73702	SUBCONTRACT NO.:	S013213A00
PHONE:	(580) 234-8780	MODIFICATION NO.:	01
FAX:	(580)237-4302		
E-MAIL:	stallings@envirotechconsulting.co		
DESCRIPTION OF MODIFICATION The subject Subcontract is herein modified to incorporate and/or change the following:			
MODIFICATION NO.	DESCRIPTION OF CHANGE	TOTAL AMOUNT	
Change Notice 01	Amended Exhibit G Rev. 0 dated 11/19/2009 which is Proforma Reference Exhibit G Rev. 14	\$No Cost	
Change Notice 02	Replace Exhibit A Rev. 6 dated 07/07/2009 with Exhibit A Rev. 7 dated 12/31/2009 and Replace Exhibit B Rev. 1 dated 12/14/2009 with Exhibit B Rev. 2 dated 01/25/2010.	\$No Cost	
Change Notice 03	Replace Exhibit A Rev. 7 dated 12/31/2009 with Exhibit A Rev. 8 dated 03/23/2010.	\$No Cost	
Change Notice 04	Replace Construction Quality Assurance Plan 0600X-QA-G0005, Rev. 0 Exhibit D, Attachment A with Construction Quality Assurance Plan 0600X-QA-G0005, Rev. 1 Exhibit D Attachment A.	\$No Cost	
Change Notice 05	Replace Construction Specifications Rev. 0 with the following Rev. 1 Construction Specifications: 1. 0600X-SP-C0077 Rev. 1 Geosynthetics 2. 0600X-SP-C0078 Rev. 1 Leachate Collection Systems and Lysimeters 3. 0600X-SP-C0082 Rev. 1 Lined Bolted Steel Liquid Storage Tanks 4. 0600X-SP-M0032 Rev. 1 Pipe, Valves and Specials	\$No Cost	
Change Notice 06	Revise Subcontract S013213A00 to incorporate the following changes: Revise Sub-grade Tolerance Specification, Change Coordinates for MH 34 and MH 35, Leachate Storage Tank 3, Design Revisions, Leachate Storage Tank, Revision to Drawings and Additions and Modifications to Leachate Transfer Line.	\$No Cost	
Change Notice 07	Replace revised Exhibit B Rev. 2, dated January 25, 2010 with Exhibit B Rev. 3, dated May 27, 2010.	\$No Cost	
Change Notice 08	Change Notice 08 adds funds to Subcontract S013213A00 for impacts to Envirotech due to the acceleration of the construction schedule.	\$7541.00	
Change Notice 09	Addition of the Washington State Department of Health Licensing	\$2368.00	

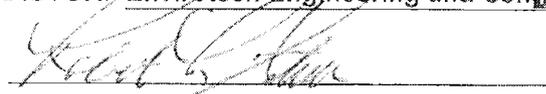
	WASHINGTON CLOSURE HANFORD LLC SUBCONTRACT MODIFICATION	
Change Notice 10 Change Notice 11	Requirements for Density Gauges. Replace Exhibit K Rev. 0 with Exhibit K Rev. 1 Add funds to Cover overtime premium for WCH directed overtime. Replace Exhibit C Rev. 3 dated January 25, 2010 with Exhibit C Rev. 4 dated August 23, 2010. Adds pay items 24, 25 and 26 to incorporate Change Notices into Exhibit C.	\$No Cost \$10,000.00
	TOTAL AMOUNT FOR MODIFICATION NO. 01	\$ 19,909.00

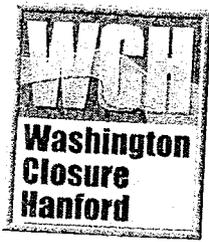
ORIGINAL SUBCONTRACT AMOUNT \$ 1,638,000.00

MODIFICATION NO. 01 \$ 19,909.00

REVISED SUBCONTRACT NOT-TO-EXCEED VALUE \$ 1,657,909.00

The price adjustment and time extension (if any) granted under this Modification constitutes payment in full for the work and schedule extension, if required, covered by this Modification, including without limitation, all direct costs; indirect costs; overhead costs; general and administrative expenses; profit; and all effects (direct, indirect, and consequential, including impacts and "ripple effects") of the work covered by this Modification on all Subcontract work, whether or not changed by this Modification. The completion date, Subcontract price and all other terms, covenants and conditions of the above-referenced Subcontract, except as duly modified by this and previous modifications, if any, remain in full force and effect.

CONTRACTOR: <u>WASHINGTON CLOSURE HANFORD LLC</u>		SUBCONTRACTOR: <u>Envirotech Engineering and Construction</u>	
Signature: 	Signature: 		
Print Name: <u>Dana Looney</u>	Print Name: <u>Mr. Robert Stallings</u>		
Title: <u>Subcontract Specialist 8-23-2010</u>	Title: <u>President</u>		



152482

July 29, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-011, CONSTRUCTION SUBCONTRACT
ACCELERATED SCHEDULE IMPACTS TO ENVIROTECH (FUNDED BY
THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-011, *Construction Subcontract Accelerated Schedule Impacts to Envirotech*.

If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

A handwritten signature in black ink, appearing to read 'Charles V. Skiba', written in a cursive style.

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachment: Change Notice CN-011



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: Envirotech Engineers & Consultants, Inc.	Letter No.:
Address: 2620 Fermi Ave. MSIN T2-11 Richland, WA 99354 Attn: Mr. Joe Voss, Project Manager	Effective Date: 06/01/10
	Subcontract No.: S013213A00
	Change Notice No.: 011 Page 1 of 1

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

**CONSTRUCTION SUBCONTRACT ACCELERATED SCHEDULED IMPACTS TO ENVIROTECH
THIS CN IS FUNDED BY THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA).**

The ERDF Construction subcontractor, TradeWind Services, LLC had accelerated their subcontract schedule work in accordance with Exhibit B, SC 4.4 through the use of overtime and weekend work. Therefore, supplemental resources were required by Envirotech to provide CQA coverage as required for the overtime and weekend work. This CN confirms WCH Construction Management authorization that the use of supplemental resources are valid and provides notification of the request to provide WCH with a breakdown of additional expenses for these resources. Please provide a detailed breakdown of expenses through your monthly invoice process and reference this CN to the STR for review and approval in accordance with subcontract policies and procedures.

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within ____ days
<input type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM:	R. Caulfield		07/29/10		
	Print Name	Signature	Date		
STR:	Charles V. Skiba		07/29/10		
	Print Name	Signature	Date		
Procurement:	Dana D. Looney		7/29/10		
	Print Name	Signature	Date		
Initial:	<input checked="" type="checkbox"/> N/A				
	Safety	QA	Eng.	Env.	RadCon

<input type="checkbox"/> Acknowledge and accept this change notice as specified.
<input type="checkbox"/> Acknowledge and accept with the exception of the following:
<input type="checkbox"/> ARE proceeding with this change notice A proposal: <input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice <input type="checkbox"/> Will be submitted within ____ days
<input type="checkbox"/> Will not be submitted

Signature:	Company: Envirotech Engineers and Consultants	Date:
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Document/CCN Number: 152482 Date: 7/29/10

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J. R.	T2-10	
X	Howard, B.J.	T2-10	X
X	Klickovich, B.D.	T2-10	X
X	Looney, D.	H4-17	X
	Melvin, W.F.	T2-10	
X	Palmersheim, S.M.	H4-17	X
X	Schilperoort, D.L.	T2-05	
X	Skiba, C.V.	T2-10	X
X	Wintle, T.E.	T2-10	X
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

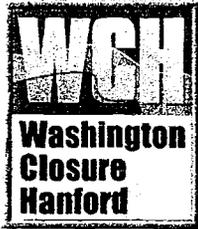
<u>Subcontract/No.</u>	<u>Change Notice</u>	<u>Description</u>
TradeWind, S012308A00	CN- _____	_____
DelHur, S010544A00	CN- _____	_____
W.Boos, 0600X-SC-G0524	CN- _____	_____
Envirotech, S66X528A00	CN- 011	Accelerated Schedule Impacts to EE&C

Comments:


 Distribution Completed: Yes: **X** No: Initials **DJ7**

TO BE COMPLETED BY R&DC:

RECORD TYPE _____
 DATA ENTRY BY _____ SCANNED/# PGS _____
 REPRO BY _____ DOCS OPEN # _____



corrected ccN
151368

~~151352~~

June 29, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-010, INCORPORATE CHANGES TO
SUBCONTRACT EXHIBIT "K" (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-010, *Incorporate Changes to Subcontract Exhibit "K"*.

If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

A handwritten signature in black ink, appearing to read 'Charles V. Skiba', written in a cursive style.

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachments: (1) Change Notice CN-010
(2) Exhibit "K", Subcontractor Operations Support Requirements, Rev. 1



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655	
Subcontractor: Envirotech Engineers and Consultants, Inc.	Letter No.:	
Address: 2620 Fermi Ave., MSIN T2-11 Richland, WA 99354 Mr. Joe Voss, Project Manager	Effective Date: 06/23/10	
	Subcontract No.: S013213A00	
	Change Notice No.: CN-010	Page 1 of 1

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:
INCORPORATE CHANGES TO SUBCONTRACT EXHIBIT "K".
 This change notice is American Recovery and Reinvestment Act of 2009 (ARRA)-funded.

Please incorporate Exhibit "K", Revision 1, Subcontractor Operations Support Requirements, into this Subcontract No. S012308A00 for ERDF Cells 9 & 10 Construction.

Envirotech is required to resubmit Exhibit "I", Submittal 07-01, WCH-DE-023, CONOPS Subcontractor Applicability and Flow-down Worksheet (CONOPS Matrix). An electronic copy of the revised CONOPS Matrix will be supplied to you in order for you to fill out the "Subcontractor Program / Procedure" column for this re-submittal where required.

The changes to Exhibit "K" are called out in the WCH Interoffice Memo (IOM) from Charles P. Ames, entitled Revision 02 to Exhibit "K", Subcontractor Operations Support Requirements, CCN 151473, dated June 10, 2010. Please disregard the Revision 02, which refers to the proforma document listed on Procurement and Property Management's Construction website. The Revision 1, specified above, applies to your specific Subcontract. This IOM failed to specifically refer to the addition of Section 4.1.03, Procedure Use and Adherence, Section 4.2.03, Training and Required Reading, plus Section 4.2.04, Required Minimum Documentation to Exhibit "K". The IOM, however, did discuss the changes brought about by these sections of the Exhibit "K" revision.

One other major change to Exhibit "K" was the revision of the WCH Integrated Work Control Program Procedure No. PAS-2-1.1, Integrated Work Control, Revision 7. This is in Section 7.0, ATTACHMENTS. Envirotech may be required to perform work associated with IWCP's generated by the SUBCONTRACTOR (TradeWind, LLC.) Therefore, Envirotech personnel performing work to an IWCP shall be trained, documented, and comply with the relevant IWCP and shall be responsible for performing work in concert with the SUBCONTRACTOR's IWCP documents.

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within _____ days
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/> _____

Project Manager/CAM:	William F. Melvin		6/28/10		
	Print Name	Signature	Date		
STR:	Charles V. Skiba		6/28/10		
	Print Name	Signature	Date		
Procurement:	Dana D. Looney		6/28/10		
	Print Name	Signature	Date		
Initial:	<input checked="" type="checkbox"/> N/A				
	Safety	QA	Eng.	Env.	RadCon



SUBCONTRACT CHANGE NOTICE

<input type="checkbox"/> Acknowledge and accept this change notice as specified.		
<input type="checkbox"/> Acknowledge and accept with the exception of the following:		
<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted
Signature:	Company: Envirotech Engineers and Consultants, Inc.	Date:

EXHIBIT K

REV. NO. 1

WASHINGTON CLOSURE HANFORD

**SUBCONTRACTOR
OPERATIONS SUPPORT REQUIREMENTS**

ERDF Maintenance Facility Design/Construction

S013213A00

1

**REQUISITION/CONTRACT
NUMBER**

REV. No.

Charles Ames / C Ames *6/28/10*

Approval

Date

TABLE OF CONTENTS

OP-1.0 PURPOSE/SCOPE	3
OP-2.0 CODES, STANDARDS, LAWS AND REGULATIONS	3
OP-3.0 DEFINITIONS	3
OP-4.0 OPERATIONS SUPPORT REQUIREMENTS	3
OP-4.1 CONDUCT OF OPERATIONS REQUIREMENTS	4
4.1.01 CONDUCT OF OPERATIONS	4
4.1.02 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	4
4.1.03 PROCEDURE USE AND ADHERENCE	4
4.1.04 REQUIRED MINIMUM DOCUMENTATION	5
OP-4.2 RESERVED	5
OP-5.0 SUBMITTALS AND AVAILABLE DOCUMENTS	7
OP-6.0 RESERVED	8
OP-7.0 ATTACHMENTS	8

WCH-DE-023, CONOPS Applicability and Flowdown Worksheet

FIGURES

None.

NOTE: All non-applicable Requirements are 'grayed out' in the Table of Contents, Forms and/or Submittal Lists.

SUBCONTRACTOR OPERATIONS SUPPORT REQUIREMENTS

OP-1.0 PURPOSE/SCOPE

This document is to be used to assist the SUBCONTRACTOR in understanding the operations support requirements of a specific project based on current conditions and/or operations in areas of the planned project. This document does not relieve the SUBCONTRACTOR and its lower-tier SUBCONTRACTORS' personnel of the requirement to plan for or provide a disciplined work control process for all work activities.

The "Operations Support Requirements" provide specific instruction to SUBCONTRACTOR in areas where there are CONTRACTOR requirements in addition to regulatory requirements, or where emphasis is needed in portions of the regulations.

Exhibit K incorporates Conduct of Operations and Work Control requirements applicable to performing work for WCH, and is hereby flowed down to SUBCONTRACTOR(s) and its lower-tier SUBCONTRACTORS.

OP-2.0 CODES, STANDARDS, LAWS and REGULATIONS

- A. In addition to the SUBCONTRACTOR operations support requirements listed in this document, the SUBCONTRACTOR shall comply with the most recent edition (unless otherwise noted) of the following (list is non-inclusive):
1. CRD O 5480.19, Change 2 (Supplemented Rev 3), Conduct of Operations Requirements for DOE Facilities, U.S. Department of Energy, Washington, D.C., as documented on form WCH-DE-023 (attached).
 2. Integrated Work Control Program (WCH PAS-2) including the following procedures:
 - PAS-2-1.1, Integrated Work Control
 - PAS-2-1.4, Job Hazard and What If Analysis

OP-3.0 DEFINITIONS

None.

OP-4.0 OPERATIONS SUPPORT REQUIREMENTS

In performance of work under this subcontract, the SUBCONTRACTOR shall comply with the following CONTRACTOR Conduct of Operations and Integrated Work Control Process (IWCP) requirements.

OP-4.1 CONDUCT OF OPERATIONS REQUIREMENTS

4.1.01 CONDUCT OF OPERATIONS

- A. The purpose of the Washington Closure Hanford (WCH) Conduct of Operations program is to ensure that facility activities are managed, organized, and conducted in a manner that results in a high level of performance and therefore contributes to safe and reliable operations. The elements of this program are fundamental to the manner in which activities are conducted to comply with Department of Energy (DOE) requirements. The SUBCONTRACTOR shall demonstrate that the mechanisms are in place to direct, monitor and verify implementation of the applicable portions of CRD O 5480.19, Conduct of Operations Requirements for DOE Facilities.
- B. The elements identified with the Conduct of Operations Requirements are specified on WCH-DE-023 "CONOPS Applicability and Flowdown Worksheet" as tailored for the contract to be awarded. Within ten (10) working days of Subcontract execution and prior to commencement of any Work, the SUBCONTRACTOR shall submit this tailored worksheet completed to include all applicable SUBCONTRACTOR procedures and processes for those requirements that are to be managed by the SUBCONTRACTOR for approval. See Attachment OP-A3 for a copy of the applicable WCH-DE-023 form.

4.1.02 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

- A. Within ten (10) working days of Subcontract execution and prior to commencement of any Work, the SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.
- B. Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the work.

4.1.03 PROCEDURE USE AND ADHERENCE

- A. Procedures/work instructions will be used in a thinking, compliant manner, using the instruction as written, with respect for the training and experience of the qualified user.
- B. If the worker believes the instructions are incorrect, the worker shall:
- Stop the activity, and place the equipment in a safe condition
 - Notify supervision
 - Proceed only after the procedure/work instruction is properly changed or resolution is obtained.
- C. Requirements for use of procedures/work instructions shall be clearly defined and understood by all personnel.

4.1.04 REQUIRED MINIMUM DOCUMENTATION – Available for CONTRACTOR/OWNER Review

- None.

OP-4.2 INTEGRATED WORK CONTROL REQUIREMENTS

This section establishes specific requirements for SUBCONTRACTORS doing work on RCCC projects.

4.2.01 INTEGRATED WORK CONTROL PROGRAM (IWCP)

- A. The SUBCONTRACTOR, working closely with the CONTRACTOR, shall utilize multi-disciplinary teamwork and worker involvement to support the identification and analysis of work site hazards associated with work scope for this subcontract in support of the integrated work control process.
- B. The SUBCONTRACTOR'S integrated work control process shall be performed in accordance with the CONTRACTOR'S procedure PAS-2-1.1, "Integrated Work Control" and PAS-2-1.4 "Job Hazard and What If Analysis" current revision. See Attachment OP-A1 for a copy of PAS-2-1.1 and OP-A2 for a copy of PAS-2-1.4. These procedures and forms will be accessible electronically for SUBCONTRACTOR personnel and CONTRACTOR will notify SUBCONTRACTOR of changes to these procedures.

Key elements of the procedure include the following:

- Assignment of the Responsible Manager, Work Planner, and Supervisor
 - Work Scope Development
 - Job Hazard Analysis
 - Work Package Preparation
 - Work Implementation
 - Changes to Work Packages
 - Work Completion
- C. As part of work performance, the SUBCONTRACTOR shall have available for review at any time, up-to-date and properly approved Work Documents.
- D. As part of work completion for each work activity, the SUBCONTRACTOR shall submit the final completed version of the Work Document. The final completed version shall include all revisions and modifications made to the initial Work Document.

4.2.02 IWCP ROLES AND RESPONSIBILITIES

D. The SUBCONTRACTOR will assume the roles and responsibilities for the listed personnel for the implementation of the Integrated Work Control process.

IWCP Organizational Title	WCH	SUBCONTRACTOR
Responsible Manager	X	
Work Control Planner		X
Work Supervisor		X

Note: The Environmental Restoration and Disposal Facility (ERDF) Super Cell 9 and 10 Construction Quality Assurance (CQA) Subcontractor shall work to the ERDF Super Cell 9 and 10 Construction Subcontractor's work packages utilizing Construction Subcontractor's Work Control Planner and Work Supervisor.

4.2.03 RESERVED

A. Reserved

B. Reserved

4.2.04 RESERVED

OP-5.0 SUBMITTALS and AVAILABLE DOCUMENTS

5.1 SUBMITTALS

Pursuant to the requirements of this Section, and the instructions provided in Exhibit I the following documentation is required to be submitted to the CONTRACTOR.

Exhibit K Subcontractor Submittal Requirements Summary

Submittal Schedule	Submittal Type Required	Distribution Designation
F Prior to Fabrication	O Original	SC Submittal to Coordinator
S Prior to Shipment	P Prints/Photocopies	SA Subcontract Administrator
B Prior to Balance of Payment	T Transparencies	FM Field/Functional Manager
X Per SAC Schedule	M Microfilm	ES Engineering Services
M Prior to Mobilization	PH Photographs	ENV Environmental Monitoring & Management
W Prior to Commencing Work	FD Floppy Disk	PAS Project Activities & Services
U Prior to Use	S Sample	SH Safety & Health
N Prior to Purchase	Q A number indicates quantity of copies	PR Procurement
Y Prior to Progress Payment for Each Specific Task		EC Environmental Compliance
Z As Required		DM Data Management
14 Number Indicates Calendar Days After Award		QA Quality Assurance (Managed by QS and/or ARQP)
		FP Fire Protection Engineer
		WM Waste Management
		RC Radiation Control
		AA CONOPS Program Manager

Notes							
1. To each item submitted, attach a copy of this form and circle the title of the item being submitted.							
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the subcontract.							
Item No / Submittal Title	Clause, Specification, or Scope of Work Paragraph	Subcontractor Send Submittal to	Submittal Codes		FOR WCH USE ONLY		
			Schedule	(No) and Type	Review	Info	
7-00 OPERATIONS SUPPORT							
7-01 WCH-DE-023, CONOPS Applicability and Flow-down Worksheet	Exhibit "K", 4.1.01	SC	W	O	FM/AA		
7-02 Subcontractor Controlled or Generated Completed Work Documents	Exhibit "K", 4.2.02	SC	B	O	FM		

5.2 AVAILABLE DOCUMENTS

Pursuant to the requirements of this Section, the following items must be available upon request in a time manner to the CONTRACTOR and maintained by the SUBCONTRACTOR.

Exhibit K Subcontractor Available Documentation Requirements Summary	
Item No./ Available Document Title	Clause, Specification, or Scope of Work Paragraph
7-00 OPERATIONS SUPPORT	
7-51 Training and Required Reading Record for Work Supervisor	Exhibit "K", 4.2.03
7-52 Training and Required Reading Record for Work Control Planner	Exhibit "K", 4.2.03
7-53 All approved work documents	Exhibit "K", 4.2.01

OP-6.0 RESERVED

OP-7.0 ATTACHMENTS

PRO/DOC NUMBER	TITLE	REQUIREMENTS / CLAUSE
WCH-DE-023	CONOPS Applicability and Flowdown Worksheet	OP-4.1.01

Note: The Environmental Restoration and Disposal Facility (ERDF) Super Cell 9 and 10 Construction Quality Assurance (CQA) Subcontractor shall work to the ERDF Super Cell 9 and 10 Construction Subcontractor's CONOPS Applicability and Flowdown Worksheet as attached to this Exhibit K.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: WCH STR: B. Jack Howard
Project/WA Title: ARRA Project Responsible Manager: William Melvin
Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Approvals:
 William Melvin / Responsible Manager
 Project Director/Responsible Manager (print name) Date: _____
 Charles P. Ames
 CONOPS Program Manager (print name) Date: _____
 Signature _____
 Signature _____

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism		
				WCH Program/ Procedure	Subcontractor Program/ Procedure	
Ch 1	OPERATIONS ORGANIZATION AND ADMINISTRATION					
	1. Operations Policies	Y	Y	PM-ESHQ-3, Safety BSC-1-7.9, Preparing, Approving, and Issuing Policies and Charters	N/A	
	2. Resources	Y	Y	WCH Contractor Performance Plan (CPP)	N/A	
	3. Monitoring of Operating Performance	Y	Y	SEM-3.2.1, Accident/Incident Investigating and Reporting Requirements PM-ESHQ-13, Performance Analysis (See Note 1)	N/A	

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).
Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.
Note 4: The Subcontractor is required to implement these activities using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion

Project/WA No: ARR A Project

WCH STR: B. Jack Howard

Project/WA Title: Super Cells 9 & 10 Construction

Responsible Manager: William Melvin

Subcontract No: R012308A00

Subcontractor Name: TradeWind Services, LLC

Subcontract Type: Construction Services

Prepared by: Charles V. Skiba

Title: Sr. Construction Subcontract Engineer

Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
4.	Accountability	Y	N	BSC-1-1.8, Performance Review and Disciplinary Action	(See NOTE 2)
5.	Management Training	Y	Y	BSC-1-2.1, Training Roles and Responsibilities	N/A
6.	Planning for Safety	Y	N	PAS-2-1.1, Integrated Work Control PAS-2-1.4, Job Hazard and What If Analysis	PAS-2.1.1 PAS-2-1.4 (See Note 4)

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
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Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.
Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: B. Jack Howard
 Project/WA Title: ARRA Project Responsible Manager: William Melvin
 Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 2	SHIFT ROUTINES AND OPERATING PRACTICES				
1.	Status Practices	Y	N	PAS-2.1.1, Integrated Work Control	(See Note 2)
2.	Safety Practices	Y	N	SH-1-2.1, Safety and Health Programs SH-1-2.6, Subcontractor Safety and Health Program	(See Note 2)
3.	Operator Inspection Tours	N	N	N/A	N/A
4.	Round/Tour Inspection Sheets	N	N	N/A	N/A
5.	Personal Protection	Y	N	RC-1-5.1, Conducting Radiological Work SH-1-2.6, Subcontractor Safety and Health Program	(See Note 2)
6.	Response to Indications	Y	N	PAS-2.1.1, Integrated Work Control	(See Note 2)
7.	Resetting Protective Devices	Y	N	SH-1-2.3, Electrical Safety	(See Note 2)
8.	Load Changes	N	N		
9.	Authority to Operate Equipment	Y	N	PAS-2.1.1, Integrated Work Control	(See Note 2)

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.

Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).

Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.

Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
 Project/WA No: WCH STR: Responsible Manager: William Melvin
 Project/WA Title: ARRA Project Subcontractor Name: TradeWind Services, LLC
 Subcontract Title: Super Cells 9 & 10 Construction
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
10.	Shift Operating Bases	Y	N		(See Note 3)
11.	Potentially Distractive Written Material and Devices	Y	N		(See Note 3)
Ch 3	CONTROL AREA ACTIVITIES FOR DOE FACILITIES				
	1. Control Access Areas	N	N/A	N/A	N/A
	2. Professional Behavior	N	N/A	N/A	N/A
	3. Monitoring the Main Control Panels	N	N/A	N/A	N/A
	4. Control Operator Ancillary Duties	N	N/A	N/A	N/A
	5. Operation of Control Area Equipment	N	N/A	N/A	N/A
Ch 4	COMMUNICATIONS				
	1. Emergency Communications Systems	Y	Y	SEM-2-3.2, Emergency Preparedness Documentation	N/A
	2. Public Address System	N	N/A	N/A	N/A
	3. Contacting Operators	N	N/A	N/A	N/A
	4. Radios	N	N/A	N/A	N/A
	5. Abbreviations and Acronyms	N	N/A	N/A	N/A
	6. Oral Instructions and Informational Communications	Y	Y	CONOPS-1-4, Communications	N/A

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Note 4: the Subcontractor will manage this activity using the procedure specified.

WCH-DE-023 (03/16/2009) Page 4 of 20

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
Project/WA No: ARRA Project WCH STR: William Melvin
Project/WA Title: Super Cells 9 & 10 Construction Responsible Manager: TradeWind Services, LLC
Subcontract Title: R012308A00
Subcontract No: Construction Services
Subcontract Type: Charles V. Skiba
Prepared by: Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 5	CONTROL OF ON-SHIFT TRAINING				
	1. Adherence to Training Programs	N	N/A	N/A	N/A
	2. On-shift Instructor Qualification	N	N/A	N/A	N/A
	3. Qualified Operator Supervision and Control of Trainees	N	N/A	N/A	N/A
	4. Operator Qualification Program Approval	N	N/A	N/A	N/A
	5. Training Documentation	N	N/A	N/A	N/A
	6. Suspension of Training	N	N/A	N/A	N/A
	7. Maximum Number of Trainees	N	N/A	N/A	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
 Project/WA No: ARRA Project WCH STR: Responsible Manager: William Melvin
 Project/WA Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC
 Subcontract Title: R012308A00
 Subcontract No: Construction Services
 Subcontract Type: Charles V. Skiba Title: Sr. Construction Date: 06/22/2010
 Prepared by: Subcontract Engineer

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 6	INVESTIGATION OF ABNORMAL EVENTS				
	1. Events Requiring Investigation	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	2. Investigation Responsibility	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	3. Investigator Qualification	Y	Y	SEM-3-2.2, Event Management	N/A
	4. Information to be Gathered	Y	Y	SEM-3-2.2, Event Management	N/A
	5. Event Investigation	Y	Y	SEM-3-2.2, Event Management	N/A
	6. Investigative Report	Y	Y	SEM-3-2.2, Event Management	N/A
	7. Event Training	Y	Y	BSC-1-2.4, Training Requirements	N/A
	8. Event Trending	Y	Y	SEM-3.1.2, Occurrence Categorization and Reporting	N/A

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Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS **FRC** **Waste Ops** **Mission Completion**
Project/WA No: **ARRA Project** **WCH STR:** **B. Jack Howard**
Project/WA Title: **Super Cells 9 & 10 Construction** **Responsible Manager:** **William Melvin**
Subcontract Title: **R012308A00** **Subcontractor Name:** **TradeWind Services, LLC**
Subcontract No: **Construction Services**
Subcontract Type: **Charles V. Skiba** **Title:** **Sr. Construction Subcontract Engineer** **Date:** **06/22/2010**
Prepared by:

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
9.	Sabotage	Y	Y	SEM-1-2.3, Reporting Security Incidents SEM-3.2.2, Event Management	N/A
10.	Event Investigation - (SCRD B.7)	Y	Y	SEM-3-2.2, Event Management	N/A

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
Project/WA No: B. Jack Howard
Project/WA Title: ARRA Project WCH STR: William Melvin
Subcontract Title: Super Cells 9 & 10 Construction Responsible Manager: TradeWind Services, LLC
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 7	NOTIFICATIONS				
	1. Notification Procedures	Y	N	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	(See NOTE 2)
	2. Notification Responsibility	Y	N	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	(See NOTE 2)
	3. Names and Phone Numbers	Y	N	SEM-3-1.1, Single Point of Contact	(See NOTE 2)
	4. Documentation	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A
	5. Communication Equipment	Y	Y	CONOPS-1-7, Notifications	N/A
	6. Notification Responsibility - (SCRD B.7)	Y	Y	SEM-3-2.1, Accident/Incident Investigating and Reporting Requirements	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).
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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
Project/WA No: WCH STR: Responsible Manager: William Melvin
Project/WA Title: ARRA Project Subcontractor Name: TradeWind Services, LLC
Subcontract Title: Super Cells 9 & 10 Construction
Subcontract No: R012308A00
Subcontract Type: Construction Services
Prepared by: Charles V. Skiba **Title:** Sr. Construction Subcontract Engineer **Date:** 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 8	CONTROL OF EQUIPMENT AND SYSTEM STATUS				
1.	Status Change Authorization and Reporting	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A
2.	Equipment and System Alignment	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A
3.	Equipment Locking and Tagging	Y	N	DOE-0336, Hanford Site Lockout/Tagout PAS-1-3.13, Miscellaneous Facility Tags	N/A
4.	Operational Limits Compliance	N	N/A	N/A	N/A
5.	Equipment Deficiency Identification and Documentation	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)
6.	Work Authorization and Documentation	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)
7.	Equipment Post-Maintenance Testing and Return to Service	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)
8.	Alarm Status	Y	Y	CONOPS-1-8, Control of Equipment and System Status	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: B. Jack Howard
 Project/WA Title: William Melvin
 Subcontract Title: TradeWind Services, LLC
 Subcontract No: ARRA Project
 Subcontract Type: Super Cells 9 & 10 Construction
 Prepared by: R012308A00
 Title: Charles V. Skiba
 Date: 06/22/2010
 WCH STR: Responsible Manager: William Melvin
 Subcontractor Name: TradeWind Services, LLC
 Title: Sr. Construction Subcontract Engineer

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
9.	Temporary Modification Control	N	N/A	N/A	N/A
10.	Distribution and Control of Equipment and System Documents	Y	Y	BSC-1-7.5, Document Control	N/A
11.	Work Authorization and Documentation - (SCRD B.5)	Y	N	PAS-2-1.1, Integrated Work Control	PAS-2-1.1 (See NOTE 4)

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.

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CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: **B. Jack Howard**
 Project/WA Title: **ARRA Project**
 Subcontract No: **Super Cells 9 & 10 Construction**
 Subcontract No: **R012308A00**
 Subcontract Type: **Construction Services**
 Prepared by: **Charles V. Skiba** Title: **Sr. Construction Subcontract Engineer** Date: **06/22/2010**

WCH STR: **William Melvin**
 Responsible Manager: **TradeWind Services, LLC**
 Subcontractor Name:

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism		
				WCH Program/ Procedure	Subcontractor Program/ Procedure	
Ch 9	LOCKOUTS AND TAGOUTS					
	1.	Lockout/Tagout Use	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	2.	Protective Materials and Hardware	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	3.	Lockout/Tagout Program	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	4.	Procedures for Lockout/Tagout	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	5.	Application of Lockout/Tagout	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	6.	Testing or Positioning of Equipment or Components	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	7.	Periodic Inspections	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
	8.	Caution Tags	Y	Y	PAS-1-3.13, Miscellaneous Facility Tags	N/A
	9.	Training and Communication	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
10.	Lockout/Tagout or/Tagout Implementation	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A	

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).
Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.
Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: B. Jack Howard
 Project/WA Title: William Melvin
 Subcontract Title: TradeWind Services, LLC
 Subcontract No: ARRA Project
 Subcontract Type: Super Cells 9 & 10 Construction
 Prepared by: Charles V. Skiba
 Title: Sr. Construction Subcontract Engineer
 Date: 06/22/2010

WCH STR: Responsible Manager: B. Jack Howard
 Subcontractor Name: TradeWind Services, LLC

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
11.	Notification of Personnel	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
12.	Outside Contractors	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
13.	Group Lockouts or Tagouts	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
14.	Shift or Personnel Changes	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
15.	Lockout/Tagout Processes at Hanford - (SCRD B.2)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
16.	Lockout/Tagout Use - (SCRD B.3)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A
17.	Tagout Authorization Forms (TAF) - (SCRD B.4)	Y	Y	DOE-0336, Hanford Site Lockout/Tagout	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).
Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.
Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
 Project/WA No: WCH STR: William Melvin
 Project/WA Title: ARRA Project TradeWind Services, LLC
 Subcontract Title: Super Cells 9 & 10 Construction
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba Date: 06/22/2010
 Title: Sr. Construction Subcontract Engineer

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 10	INDEPENDENT VERIFICATION				
	1. Components Requiring Independent Verification	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
	2. Occasions Requiring Independent Verification	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
	3. Verification Techniques	Y	Y	PAS-2-1.1, Integrated Work Control	N/A
Ch 11	LOGKEEPING				
	1. Establishment of Operating Logs	Y	Y	CONOPS-1-11, Log-keeping	N/A
	2. Timeliness of Recording	Y	Y	CONOPS-1-11, Log-keeping	N/A
	3. Information to be Recorded	Y	Y	CONOPS-1-11, Log-keeping	N/A
	4. Legibility	Y	Y	CONOPS-1-11, Log-keeping	N/A
	5. Corrections	Y	Y	CONOPS-1-11, Log-keeping	N/A
	6. Log Review	Y	Y	CONOPS-1-11, Log-keeping	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.

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Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion **B. Jack Howard**
 Project/WA No: **ARRA Project** WCH STR: **William Melvin**
 Project/WA Title: **Super Cells 9 & 10 Construction** Responsible Manager: **TradeWind Services, LLC**
 Subcontract No: **R012308A00** Subcontractor Name:
 Subcontract Type: **Construction Services** Title: **Sr. Construction** Date: **06/22/2010**
 Prepared by: **Charles V. Skiba** Subcontract Engineer

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
7.	Care and Keeping of Logs	Y	Y	CONOPS-1-11, Log-keeping	N/A
Ch 12	OPERATIONS TURNOVER				
1.	Turnover Checklists	Y	Y	CONOPS-1-12, Operations Turnover	N/A
2.	Document Review	N	N/A	N/A	N/A
3.	Control Panel Walkdown	N	N/A	N/A	N/A
4.	Discussion and Exchange of Responsibility	N	N/A	N/A	N/A
5.	Shift Crew Briefing	N	N/A	N/A	N/A
6.	Relief's Occurring During the Shift	N	N/A	N/A	N/A
Ch 13	OPERATIONS ASPECTS OF FACILITY CHEMISTRY AND UNIQUE PROCESSES				
1.	Operator Responsibilities	N	N/A	N/A	N/A
2.	Operator Knowledge	N	N/A	N/A	N/A
3.	Operator Response to Process Problems	N	N/A	N/A	N/A
4.	Communicating Between Operations and Process Personnel	N	N/A	N/A	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA), timely completion of scheduled surveillances, and minimizing waste.

Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).

Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.

Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion
 Project/WA No: B. Jack Howard
 Project/WA Title: William Melvin
 Subcontract Title: TradeWind Services, LLC
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba
 Title: Sr. Construction Subcontract Engineer
 Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 14	REQUIRED READING				
	1.	File Index	Y	N	BSC-1-2.11, Required Reading
	2.	Reading Assignments	Y	N	BSC-1-2.11, Required Reading
	3.	Required Dates for Completion of Reading	Y	N	BSC-1-2.11, Required Reading
	4.	Documentation	Y	N	BSC-1-2.11, Required Reading
	5.	Review	Y	N	BSC-1-2.11, Required Reading

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.

Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).

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Note 4: the Subcontractor will manage this activity using the procedure specified.

WCH-DE-023 (03/16/2009) Page 15 of 20

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
 Project/WA No: WCH STR: William Melvin
 Project/WA Title: ARRA Project Responsible Manager: TradeWind Services, LLC
 Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name:
 Subcontract No: R012308A00
 Subcontract Type: Construction Services Title: Sr. Construction Date: 06/22/2010
 Prepared by: Charles V. Skiba Subcontract Engineer

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 15	TIMELY ORDERS TO OPERATORS				
	1. Content and Format	Y	Y	CONOPS-1-15, Timely Orders	N/A
	2. Issuing, Segregating, and Reviewing Orders	Y	Y	CONOPS-1-15, Timely Orders	N/A
	3. Removal of Orders	Y	Y	CONOPS-1-15, Timely Orders	N/A
Ch 16	OPERATIONS PROCEDURES				
	1. Procedure Development	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	2. Procedure Content	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	3. Procedure Changes and Revisions	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
	4. Procedure Approval	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.

Note 2: Procedures and policies for this conduct of operations element should be managed within the Subcontractor organization. The Subcontractor may elect to use, or supplement their policies with the WCH identified policies and procedures with agreement of the Subcontractor Technical Representative (STR).

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Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
 Project/WA No:
 Project/WA Title: ARRA Project Responsible Manager: William Melvin
 Subcontract Title: Super Cells 9 & 10 Construction Subcontractor Name: TradeWind Services, LLC
 Subcontract No: R012308A00
 Subcontract Type: Construction Services
 Prepared by: Charles V. Skiba Title: Sr. Construction Subcontract Engineer Date: 06/22/2010

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
5.	Procedure Review	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
6.	Procedure Availability	Y	Y	PAS-1.1.1, Technical Procedure Development and Implementation	N/A
7.	Procedure Use	Y	N	PAS-1.1.1, Technical Procedure Development and Implementation	(See NOTE 2)
Ch 17	OPERATOR AID POSTINGS				
	1. Operator Aid Development	Y	Y	CONOPS-1-17, Operator Aids	N/A
	2. Approval	Y	Y	CONOPS-1-17, Operator Aids	N/A
	3. Posting	Y	Y	CONOPS-1-17, Operator Aids	N/A
	4. Use of Operator Aids	Y	Y	CONOPS-1-17, Operator Aids	N/A
	5. Documentation	Y	Y	CONOPS-1-17, Operator Aids	N/A
	6. Review	Y	Y	CONOPS-1-17, Operator Aids	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.

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Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.

Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet

Project: D4/ISS FRC Waste Ops Mission Completion B. Jack Howard
 Project/WA No: WCH STR: Responsible Manager: William Melvin
 Project/WA Title: ARRA Project Subcontractor Name: TradeWind Services, LLC
 Subcontract Title: Super Cells 9 & 10 Construction
 Subcontract No: R012308A00
 Subcontract Type: Construction Services Title: Sr. Construction Subcontract Engineer Date: 06/22/2010
 Prepared by: Charles V. Skiba

Guideline Chapter	Chapter Title	Applies (Y/N)	WCH as Administrator (Y/N)	Implementing Mechanism	
				WCH Program/ Procedure	Subcontractor Program/ Procedure
Ch 18	EQUIPMENT AND PIPING LABELING				
	1. Components Requiring Labeling	Y	Y	CONOPS-1-18, Equipment and Piping Labeling	N/A
	2. Label Information	N	N/A	N/A	N/A
	3. Label Placement	N	N/A	N/A	N/A
	4. Replacing Labels	N	N/A	N/A	N/A

Note 1: Specific Conduct of Operations related areas for monitoring, trending, and analysis include As-Low-As-Reasonably-Achievable (ALARA); timely completion of scheduled surveillances; and minimizing waste.
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Note 3: Procedures and policies for this conduct of operations element is to be managed by the Subcontractor organization.
Note 4: the Subcontractor will manage this activity using the procedure specified.

CONOPS Applicability and Flowdown Worksheet Instructions

Block Id	Block Title	Instruction
1	Project:	Check Project Location (e.g., D4/ISS, FRC, Waste Ops)
2	Project/WA No.:	Enter Project/Work Activity tracking number
3	WCH STR	Print name of STR. If a subcontractor is assigned to the project/work package
4	Project/WA Title:	Enter Project/Work Activity title
5	Responsible Manager	Print name of Responsible Manager
6	Subcontract Title:	Enter title of subcontract (i.e., procurement) document
7	Subcontract Name:	Enter name of subcontractor
8	Subcontract No.:	Enter Subcontract, Requisition or Procurement tracking number
9	Subcontract Type:	Enter Type of contract (e.g., onsite services, onsite materials, staff aug, etc.)
10	Prepared by:	Print/Sign Preparer's Name Print/Sign Preparer's Title Sign Date prepared
11	Approvals Project Director:	Print Project Director's/Responsible Manager's Name (RM signs when no deviations identified) Sign Project Director's/Responsible Manager's Title Sign Date Project Director/Responsible Manager approved worksheet
12	Approvals CONOPS Program Administrator:	Print CONOPS Program Manager's Name Sign CONOPS Program Manager's Title Sign Date CONOPS Program Manager approved worksheet

Column Guidance

For the **Applies (Y/N)** column:

- Y - requirement applies to the project/activity
 - N - requirement doesn't apply to the project/activity
- Typically, this column will represent the applicable sections identified in WCH-98 for that project.

For the **WCH as Administrator (Y/N)** column:

- Y - requirement applies, but WCH is going to maintain compliance control and implementation
- N - requirement applies and the subcontractor will be responsible for demonstration of compliance
- NA - requirement didn't apply as seen in the previous column *Applies (Y/N)*.

CONOPS Applicability and Flowdown Worksheet Instructions

For the **WCH Program/Procedure** column:

N/A if the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use their own procedure/program to implement the requirement.
N/A if the **WCH as Administrator (Y/N)** column was marked as **Y AND** the Subcontractor has no or minimal involvement. The WCH procedures may be provided in this instance
If the **WCH as Administrator (Y/N)** column was marked as **Y AND** the Subcontractor is required to directly support the performance of the requirement (e.g., LOTO), insert WCH procedure/policy number (and section, if applicable).
If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use a WCH/DOE procedure/program to implement the requirement, insert WCH/DOE procedure/policy number (and section, if applicable).

For the **Subcontractor Program/Procedure** column:

N/A if the **WCH as Administrator (Y/N)** column was marked as **Y**.
If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use a WCH/DOE procedure/program to implement the requirement. WCH/DOE procedure/policy number (and section, if applicable) (e.g., DOE-0336 for LOTO)
If the **WCH as Administrator (Y/N)** column was marked as **N AND** the Subcontractor is going to use their own procedure/program to implement the requirement, insert Subcontractor procedure/policy number (and section, if applicable).

Document/CCN Number: ~~151352~~

Date: June 29, 2010

Duplicate CCN

*Corrected CCN
151368
7/4/10*

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	NAME	MISN	With Att.
	Day, J.R.	T2-10	
	Howard, B.J.	T2-10	
	Klickovich, B.D.	T2-10	
X	Looney, D.	H4-17	X
	Melvin, W.F.	T2-10	
	Palmsheim, S.M.	H4-17	
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	X
	Wintle, T.E.	T2-10	
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- _____

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

CN- _____

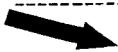
Envirotech, S013213A00

CN- 010

Incorporate changes to Exhibit "K"

Comments:

Re-issued to change CCN #



Distribution Completed:

Yes: **X**

No:

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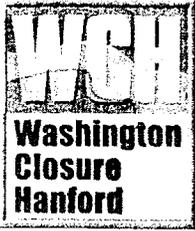
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DOCS OPEN # _____

10



*NOTE: CORRECTED CCN: 151367

~~150367~~

July 12, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-009, ADDITION OF THE WASHINGTON STATE
DEPARTMENT OF HEALTH LICENSING REQUIREMENTS FOR
DENSITY GAUGES (FUNDED BY THE AMERICAN RECOVERY AND
REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-009, *Addition of the Washington State Department of Health Licensing Requirements for Density Gauges.*

If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

Charles V. Skiba
Subcontract Technical Representative

COPY

CVS:djt

Attachments: (1) Change Notice CN-009

Document/CCN Number: *150367 Date: July 12, 2010

*NOTE: CORRECTED CCN: 151367

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J.R.	T2-10	
	Howard, B.J.	T2-10	
	Klickovich, B.D.	T2-10	
X	Looney, D.	H4-17	X
	Melvin, W.F.	T2-10	
	Palmersheim, S.M.	H4-17	
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	X
	Wintle, T.E.	T2-10	
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- _____

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

CN- _____

Envirotech, S013213A00

CN- 009

Addition of WSDOH to licensing req's.

Comments:

***THIS DISTRIBUTION SHEET AND ATTACHMENTS ARE ISSUED TO CORRECT THE DOCUMENT CONTROL NUMBER (CCN) ONLY. THERE ARE NO OTHER CHANGES.**



Distribution Completed: Yes: **X** No: Initials **DJF**

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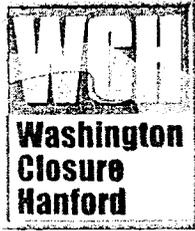
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*NOTE: CORRECTED CCN: 151366

~~150366~~

July 12, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

COPY

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-008, ACCELERATED SCHEDULE IMPACTS TO
ENVIROTECH ENGINEERS & CONSULTANTS, INC. (FUNDED BY THE
AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-008, *Accelerated Schedule Impacts to Envirotech Engineers & Consultants, Inc.*

If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Skiba'.

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachments: (1) Change Notice CN-008

COPY

Document/CCN Number: *~~150366~~ Date: July 12, 2010

*NOTE: CORRECTED CCN: 151366

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J.R.	T2-10	
	Howard, B.J.	T2-10	
	Klickovich, B.D.	T2-10	
X	Looney, D.	H4-17	X
	Melvin, W.F.	T2-10	
	Palmerheim, S.M.	H4-17	
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	X
	Wintle, T.E.	T2-10	
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00	CN- _____	_____
DelHur, S010544A00	CN- _____	_____
W.Boos, 0600X-SC-G0524	CN- _____	_____
Envirotech, S013213A00	CN- 008	Accelerated schedule impacts to EE&C

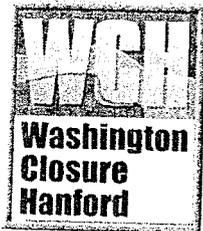
Comments:

***THIS DISTRIBUTION SHEET AND ATTACHMENTS ARE ISSUED TO CORRECT THE DOCUMENT CONTROL NUMBER (CCN) ONLY. THERE ARE NO OTHER CHANGES.**

Distribution Completed: Yes: **X** No: Initials **DF7**

TO BE COMPLETED BY R&DC:

RECORD TYPE _____	
DATA ENTRY BY _____	SCANNED/# PGS _____
REPRO BY _____	DOCS OPEN # _____



150666

June 10, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-007, INCORPORATE CHANGES TO
SUBCONTRACT EXHIBIT "B" (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-007, *Incorporate Changes to Subcontract Exhibit "B"*.

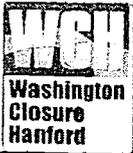
If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachments: (1) Change Notice CN-007
(2) Exhibit "B", Special Conditions, Rev.3



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: Envirotech Engineers and Consultants, Inc.	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-11 Richland, WA 99354 Mr. Joe Voss, Project Manager	Effective Date: 06/09/10
	Subcontract No.: S013213A00
Change Notice No.: CN-007	Page 1 of 1

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:
INCORPORATE CHANGES TO SUBCONTRACT EXHIBITS "B".
 This change notice is American Recovery and Reinvestment Act of 2009 (ARRA)-funded.

Envirotech Engineers and Consultants are hereby directed to replace Exhibit "B", Special Conditions with the new attached revision 3 (Proforma Version 8). WCH does not consider the revision to Exhibits "B" to have any cost impact, and should not require a cost proposal.

Attachment: Exhibit "B" Rev. 3, Special Conditions

- | | |
|---|---|
| <input checked="" type="checkbox"/> Proceed with work | <input type="checkbox"/> Notice to proceed required |
| <input checked="" type="checkbox"/> No change in price authorized | <input checked="" type="checkbox"/> No extension of time authorized |
| <input checked="" type="checkbox"/> Proposal not required | <input type="checkbox"/> Submit proposal within ____ days |
| <input checked="" type="checkbox"/> Drawings/Data attached | <input type="checkbox"/> |

Project Manager/CAM: William F. Melvin Print Name		6/9/10 Date			
STR: Charles V. Skiba Print Name		6-9-10 Date			
Procurement: Dana D. Looney Print Name		6-10-10 Date			
Initial:	<input checked="" type="checkbox"/> N/A				
Safety	QA	Eng.	Env.	RadCon	

- Acknowledge and accept this change notice as specified.
- Acknowledge and accept with the exception of the following:
- | | | |
|---|-------------|---|
| <input type="checkbox"/> ARE proceeding with this change notice | A proposal: | <input type="checkbox"/> Has been submitted |
| <input type="checkbox"/> ARE NOT proceeding with this change notice | | <input type="checkbox"/> Will be submitted within ____ days |
| | | <input type="checkbox"/> Will not be submitted |

Signature:	Company: Envirotech Engineers and Consultants, Inc.	Date:
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EXHIBIT "B"

SPECIAL CONDITIONS

CONSTRUCTION SUBCONTRACTS

**ERDF SUPER CELLS 9 & 10 CONSTRUCTION QUALITY
ASSURANCE (CQA)**

SUBCONTRACT NUMBER S013213A00

**EXHIBIT B
SPECIAL CONDITIONS
CONSTRUCTION SUBCONTRACT**

WASHINGTON CLOSURE HANFORD LLC

TABLE OF CONTENTS

SC	Title	Page No.
1.0	SCOPE	1
2.0	DEFINITIONS	1
3.0	TERMS OF PAYMENT	1
SC 3.1	RESERVED	1
SC 3.2	RESERVED	1
SC 3.3	MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK	1
SC 3.4	EXPENDITURE NOTIFICATION	4
SC 3.5	PRICING ADJUSTMENTS	5
4.0	THE SUBCONTRACTOR	7
SC 4.1	POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	7
SC 4.2	Reserved	7
SC 4.3	SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES	7
SC 4.4	COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK	10
SC 4.5	SUBCONTRACT SCHEDULE	12
SC 4.6	Reserved	14
SC 4.7	SECURITY AND HAZARD COMMUNICATION PROGRAMS	14
SC 4.8	Reserved	14
SC 4.9	SUBCONTRACTOR KEY PERSONNEL	15
SC 4.10	RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE	15
SC 4.11	Reserved	16
5.0	THE CONTRACTOR	16
SC 5.1	CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS	16
SC 5.2	CONTRACTOR-FURNISHED UTILITIES AND SERVICES	16
SC 5.3	CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT	17
SC 5.4	CONTRACTOR-FURNISHED PERMITS	18
SC 5.5	AUTHORITY OF PERSONNEL	18
SC 5.6	DISPOSITION OF CONTAMINATED MATERIAL	20
6.0	GENERAL SUBCONTRACT PROVISIONS	19
SC 6.1	WORK HOURS AND FACILITY CLOSURE DAYS	19
SC 6.2	WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL	20
SC 6.3	SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION	20
SC 6.4	INCREMENTAL FUNDING OF SUBCONTRACT	20
SC 6.5	TECHNICAL DIRECTION	22
SC 6.6	TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY)	23
SC 6.7	INTEGRATED WORK CONTROL PROGRAM	25
SC 6.8	SAFETY INCENTIVE	25

1.0 SCOPE

This Exhibit B provides Special Terms and Conditions that apply specifically to this Subcontract and SUBCONTRACTOR providing construction technical services to Washington Closure Hanford LLC.

2.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH) and all of its authorized representatives acting in their professional capacities in performance of OWNER'S Contract No. DE-AC06-05RL14655. To the extent that the CONTRACTOR is not the ultimate user of the services required herein, all rights, benefits and remedies conferred by Subcontractor shall also accrue and be available to and are for the express benefit of the OWNER for which the Services are required.

"JOBSITE" and "SITE" means the location(s) at which or for which the Services will be provided.

"OWNER" means the United States Department of Energy (DOE) / United States Government.

"WORK" and "SERVICES" means all technical and professional Services and responsibilities to be performed by the SUBCONTRACTOR as specified, stated, indicated or implied in the Master Agreement Subcontract or Job Order, including the furnishing and supervision of all technical personnel and the supply of all equipment, materials and supplies necessary or required to perform the Master Agreement Subcontract or Job Order.

"SUBCONTRACTOR" means the company, corporation, partnership, individual or other entity to which the Master Agreement Subcontract or Job Order is issued, its authorized representatives, successors, and permitted assigns.

"PROGRAM" means the performance of the requirements of Contract No. DE-AC06-05RL14655

"SUBCONTRACT TECHNICAL REPRESENTATIVE" is designated by the CONTRACTOR as the individual responsible for the technical aspects of the performance of the Subcontract.

"SUBCONTRACT SPECIALIST" is designated by the CONTRACTOR as the individual responsible for administering the Subcontract terms and conditions and who acts as CONTRACTOR's authorized representative.

3.0 TERMS OF PAYMENT

SC 3.1 RESERVED

SC 3.2 RESERVED

SC 3.3 MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK

3.3.1 For the purpose of arriving at agreement on the basis for progress payments for items bid as lump sum, SUBCONTRACTOR shall, within fifteen (15) calendar days after award, submit a proposed breakdown of values of the various elements of the Work comprising the lump sum item. Such submittal shall also include a proposed schedule of monthly progress payments. The proposed breakdown and payment schedule shall be correlated with the schedule and reports required by the Special Condition entitled "SUBCONTRACT SCHEDULE". Such breakdown and payment schedule shall be subject to CONTRACTOR'S approval.

- 3.3.2 Estimates shall be prepared by SUBCONTRACTOR and submitted in writing for CONTRACTOR'S approval on or about the end of each month covering the amount and value of Work satisfactorily performed by SUBCONTRACTOR up to the date of such estimate. Such estimate may be made by strict measurement, or by estimate, or partly by one method and partly by another. Estimates shall be based on cumulative total quantities of Work performed. Estimates may include materials or equipment not incorporated into the Work. The quantity of Work to be paid for under any item for which a unit price is fixed in the Subcontract shall be the amount or number, approved by CONTRACTOR, of units of Work satisfactorily completed in accordance with this Subcontract and computed in accordance with applicable measurement for payment provisions of this Subcontract.
- 3.3.3 SUBCONTRACTOR shall make all surveys necessary for determining quantities of Work to be paid for under this Subcontract. Copies of field notes, computations, and other records made by SUBCONTRACTOR to determine quantities shall be furnished to CONTRACTOR upon request. SUBCONTRACTOR shall notify CONTRACTOR before such surveys are made.
- 3.3.4 CONTRACTOR, at its discretion, may arrange to have its representative witness and verify surveys made by SUBCONTRACTOR for determining quantities of Work to be paid for under this Subcontract. Measurements and computations shall be made by such methods as CONTRACTOR may consider appropriate for the class of Work measured, and the estimate of quantities of Work completed shall be compatible with the reporting requirements required hereunder by the Special Condition titled "SUBCONTRACT SCHEDULE". The dividing limits, lines, or planes between adjacent items or classes of excavation, concrete, or other types of Work where not definitely indicated on the drawings or in the specifications shall be as determined by CONTRACTOR.
- 3.3.5 Review by CONTRACTOR of SUBCONTRACTOR'S estimate of the amount and value of the Work performed will be within ten (10) calendar days of its receipt and a copy of the estimate as approved returned to SUBCONTRACTOR. SUBCONTRACTOR shall prepare and submit to CONTRACTOR an invoice in accordance with the estimate as approved. SUBCONTRACTOR shall certify in each application for payment that there are no known outstanding mechanic's or material-men's liens and that all due and payable bills have been paid or are included in the application for payment. Such certification shall be on the CONTRACTOR furnished "Request for Payment (Construction Subcontracts)" form that may be down-loaded from www.wch-rc.com. In addition, an Electronic Funds Transfer (EFT) form is provided to allow payments to be forwarded to the SUBCONTRACTOR'S bank account electronically. The EFT form will need to be completed by the CONTRACTOR and the CONTRACTOR'S bank. The bank needs to return the form to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attn: Accounts Payable

- 3.3.6 Reserved
- 3.3.7 CONTRACTOR may, as a condition precedent to any such payment to SUBCONTRACTOR, require SUBCONTRACTOR to submit complete waivers and releases of all claims of any person, firm, or corporation in connection with or in any way related to the performance of this Subcontract. Upon request, SUBCONTRACTOR shall also furnish acceptable evidence that such claims have been satisfied.
- 3.3.8 SUBCONTRACTOR shall submit, as required by CONTRACTOR, on a monthly basis, an accurate current and complete list of open purchase orders and subcontracts which include contact information (name and telephone number). CONTRACTOR reserves the right to use the contact information to verify prompt payment by SUBCONTRACTOR.

- 3.3.9 Any amounts otherwise payable under this Subcontract may be withheld, in whole or in part, if:
- (a) Any claims are filed against SUBCONTRACTOR by CONTRACTOR, OWNER or third parties, or if reasonable evidence indicates the probability of filing any such claims; or
 - (b) SUBCONTRACTOR is in default of any Subcontract condition including, without limitation, the schedule, quality, and safety requirements; or
 - (c) There is reasonable doubt that this Subcontract can be completed within the time specified or for the balance then unpaid; or
 - (d) SUBCONTRACTOR has not submitted:
 - 1. Schedules and progress reports, as defined in the Special Condition titled "SUBCONTRACT SCHEDULE",
 - 2. Property insurance certificates, or not provided proper coverage or proof thereof,
 - 3. Its safety, security, and fire prevention plans, or
 - 4. Waivers and Releases or Waivers and Releases submitted with invalid information.
 - 5. Certified copies of payroll records required that are up to date to within two (2) weeks of the date SUBCONTRACTOR submits any invoice for payment.

3.3.10 CONTRACTOR will pay such withheld payments if SUBCONTRACTOR:

- (a) Pays, satisfies, or discharges any claim of CONTRACTOR, OWNER, or third parties against SUBCONTRACTOR arising out of or in any way connected with this Subcontract; or
- (b) Cures all defaults in the performance of this Subcontract.

3.3.11 If claims filed against SUBCONTRACTOR connected with performance under this SUBCONTRACT are not promptly removed by SUBCONTRACTOR after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may remove such claims and deduct all costs in connection with such removal from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. If the amount of such withheld payment or other monies due SUBCONTRACTOR is insufficient to meet such costs, or if any claim against SUBCONTRACTOR is discharged by CONTRACTOR after final payment is made, SUBCONTRACTOR shall promptly pay CONTRACTOR all costs incurred thereby, regardless of when such claim arose or whether such claim imposed a lien upon the Project or the real property upon which the Project is situated.

3.3.12 If CONTRACTOR is notified that SUBCONTRACTOR has failed to pay valid invoice submitted by sub-tier supplier or subcontractor in accordance with the payment terms of a valid sub-tier subcontract or purchase order for expenditures made under the scope of work of the SUBCONTRACT, SUBCONTRACTOR shall promptly pay such invoice. If invoices are not promptly paid by SUBCONTRACTOR within seven (7) days after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may pay such invoices directly to the sub-tier supplier or subcontractor and deduct all costs in connection with such payment from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. CONTRACTOR also reserves the right to require SUBCONTRACTOR to submit separate invoices for any or all sub-tier subcontractors or suppliers and to make payment to the sub-tier supplier or subcontractor on behalf of SUBCONTRACTOR.

- 3.3.13 If a lien is filed, SUBCONTRACTOR shall remove the lien, or see that it is removed or shall furnish a bond for the full amount thereof within seven (7) calendar days of notice by CONTRACTOR. SUBCONTRACTOR shall obtain for itself legally effective waivers of lien and furnish same to CONTRACTOR with each application for payment. Failure to comply with the foregoing requirements shall constitute grounds for termination of this Subcontract in accordance with the General Condition titled, "TERMINATION FOR DEFAULT".
- 3.3.14 Upon receipt by SUBCONTRACTOR of CONTRACTOR'S written notice of Final Acceptance of the Work under this Subcontract, SUBCONTRACTOR shall prepare an estimate in writing for CONTRACTOR's approval of the amount and value of all Work satisfactorily completed under this Subcontract. Upon CONTRACTOR's approval of such estimate, SUBCONTRACTOR shall prepare and submit its final invoice in accordance with the approved estimate. Unless otherwise specified by applicable law, CONTRACTOR shall, within sixty (60) calendar days following Final Acceptance and after submittal of such invoice, pay to SUBCONTRACTOR the amount then remaining due, provided that, SUBCONTRACTOR shall have furnished CONTRACTOR and OWNER for itself, its subcontractors, immediate and remote, and all material suppliers, vendors, laborers, and other parties acting through or under it, waivers and releases of all claims against CONTRACTOR or OWNER arising under or by virtue of this Subcontract, except such claims, if any, as may with the consent of CONTRACTOR and OWNER be specifically excepted by SUBCONTRACTOR from the operation of the release in stated amounts to be set forth therein.
- 3.3.15 No payments of invoices or portions thereof shall at any time constitute approval or acceptance of Work under this Subcontract, nor be considered to be a waiver by CONTRACTOR or OWNER of any of the terms of this Subcontract. However, title to all material and equipment for which payment has been made, whether or not the same has been incorporated in the Work, and title to all completed Work whether paid for or not, shall vest in CONTRACTOR, or OWNER as the case may be, and in any case shall not be part of SUBCONTRACTOR'S property or estate in the event SUBCONTRACTOR is adjudged bankrupt or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of SUBCONTRACTOR'S insolvency.
- 3.3.16 Invoices for monthly progress payments and final payment should be signed and submitted along with a completed and signed "Request for Payment (Construction Subcontracts)" form in one (1) original copy to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Accounts Payable
Reference: Subcontract Number: **S013213A00**

SC 3.4 EXPENDITURE NOTIFICATION

- 3.4.1 SUBCONTRACTOR shall furnish to the address below the best estimate of the total billable cost (invoiced and invoiceable) from Award of the Subcontract through the current calendar month end. This information must be submitted in writing (facsimile acceptable) no later than the 15th of each month.

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Subcontract Specialist
Dana Looney (509) 372-9499
Fax: (509) 372-9049.

- 3.4.2 For Work performed on a unit-rate basis, SUBCONTRACTOR shall notify the CONTRACTOR'S Subcontract Specialist in writing when SUBCONTRACTOR expects that in the next sixty (60) calendar days billable charges, when added to all previously billed charges, will exceed seventy-five percent (75%) of the estimated Subcontract value shown in Exhibit "C". Upon expending seventy-five percent (75%) of the estimated Subcontract value, SUBCONTRACTOR shall provide the CONTRACTOR'S authorized representative with weekly written summaries of billable charges, inclusive of previously billed charges.
- 3.4.3 The CONTRACTOR is not obligated to reimburse the SUBCONTRACTOR for billable charges in excess of the estimated Subcontract value, as modified. The SUBCONTRACTOR is not obligated to continue performance under this Subcontract once billable charges reach one hundred percent (100%) of the estimated Subcontract value, as modified.

SC 3.5 PRICING ADJUSTMENTS

When costs are a factor in any determination of a Subcontract adjustment pursuant to the General Condition titled, "CHANGES", or any other provision of this Subcontract unless excluded therein, such direct and indirect costs, upward or downward, for labor, equipment, and material necessary to perform the Work of the Change shall be determined in accordance with the following:

- 3.5.1 Determination of direct labor hours for changes involving added or deleted work shall be as follows:
- (a) Direct labor hours necessary to perform the Work or the Change shall be established by applying standards from the most recent edition of *Building Construction Cost Data* (Means), published by R. S. Means Company, Inc.; or other CONTRACTOR-approved data-base, as may have been previously developed by SUBCONTRACTOR.
 - (b) In addition to direct payroll costs, direct labor costs shall include payroll taxes and insurance, vacation allowance, subsistence, travel allowance, overtime premium and any other payroll additives required to be paid by SUBCONTRACTOR by law or labor agreement(s) (e.g., Department of Labor Wage Determination, bargaining agreements such as the Hanford Site Stabilization Agreement, etc.).
 - (c) Charges for labor furnished and used by SUBCONTRACTOR shall include all manual classifications up to and including foremen. Labor rates used to calculate the costs shall be those rates in effect during accomplishment of the change. Charges shall not be included for superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics. These charges will be included in the indirect rate as set forth below.
- 3.5.2 Determination of direct costs of equipment for changes involving added or deleted work shall be as follows:
- (a) Allowable equipment costs of in-use or stand-by SUBCONTRACTOR-owned equipment will be computed by utilizing eighty percent (80%) of the rates set forth in the most current *Rental Rate Blue Book for Construction Equipment* (hereinafter referred to as the Blue Book), found at www.equipmentwatch.com, as adjusted for age of equipment in Region "F" provided such rates exclude unallowable or unacceptable costs in accordance with FAR 31.105. Hourly rates will be developed by using monthly rates divided by 166.7 hours based on a 4 day/10 hour per day work schedule...
 - 1. In-use or operating equipment rates will be developed by calculating the depreciation, major overhaul, and cost of facilities capital (CFC) portion of the Blue

Book rates. Blue Book indirect costs will not be allowed (they should be included as indirect rates as set forth below). The estimated operating cost per hour for consumables, including, but not limited to, maintenance labor and parts, fuel, oil, filters, lubricants, and tires will be allowed.

2. Stand-by equipment rates will be developed by calculating the CFC portion and one-half the depreciation portion of the Blue Book rate element table allowance. Blue Book indirect costs and major overhaul costs will not be allowed. The estimated operating cost per hour for consumables, including but not necessarily limited to, maintenance labor and parts; fuel, oil, filters, lubricants, and tires can not be included.

(b) Equipment costs of in-use or stand-by SUBCONTRACTOR-rented equipment shall be computed as follows: CONTRACTOR shall develop "market rates" commensurate with rates from equipment rental firms for similar equipment within the area. Should SUBCONTRACTOR-proposed rates not be comparative, CONTRACTOR reserves the right to delete unreasonable charges.

(c) When the equipment is operated infrequent and such equipment need not remain at the site of the Work continuously, as determined by the CONTRACTOR, charges shall be limited to actual hours of use. Equipment not operating, but retained at the jobsite at CONTRACTOR'S direction, shall be charged at the standby rate.

3.5.3 Direct costs of materials for changes involving added or deleted work shall be determined in the following ways:

(a) From published supplier pricing data or written quotes from suppliers on specific items where published pricing data is not generally available (invoices from suppliers are acceptable); or

(b) From standards published in Means, or other CONTRACTOR-approved data previously developed by SUBCONTRACTOR if information identified in paragraph (a) above is not available.

3.5.4 When pricing adjustments, the following are considered to be included as indirect costs, and as such may not be considered, and will not be compensated, as direct costs. Jobsite office expenses, incidental job burdens, small tools, general office overhead allocation, and costs for estimating the price of changed work.

3.5.5 The following shall apply to determine the indirect cost portion of Subcontract Price adjustments. CONTRACTOR recognizes Washington State business and occupation (B&O) tax rate of RCW 82.04.263 (currently 0.471 percent) as applicable to price adjustments to this Subcontract. Paragraphs (a), (b), and (c) below will apply when the adjustment does not meet the criteria for submittal of Certified Cost and Pricing data. **It must be emphasized that indirect rates in the paragraph (b) and (c) below are maximum rates and CONTRACTOR reserves the right to negotiate the indirect expense rates within the ceiling limitations.**

(a) SUBCONTRACTOR'S and lower-tier subcontractor's overhead and profit shall be considered to include the following: insurance cost; small tools having a purchase price of \$500.00 or less; incidental job burdens; general home office expenses commonly known as G&A; labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics, as well as any other items specified for Overhead and Operations in Exhibit C. Unless otherwise stated, no separate allowance will be made and costs of premium adjustments, consequent upon changes ordered, for Payment and Performance Bonds (allowable for SUBCONTRACTOR only).

Note labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics are included in overhead & profit when the change notice occurs in the timeframe of the subcontract baseline schedule. If the change notice takes place outside the baseline schedule (i.e. added scope) then direct labor charges for these types of personnel are allowed.

- (b) Overhead and Profit allowance for SUBCONTRACTOR or lower-tier subcontractors on work performed by lower-tier subcontractors shall be calculated as follows: a maximum mark-up of ten percent (10%) shall be applied to the aggregate of sub-tier subcontractor charges less than or equal to \$25,000; a maximum mark-up of seven and one-half percent (7 ½%) shall be applied to the aggregate of sub-tier subcontractor charges greater than \$25,000 but less than or equal to \$650,000; a maximum mark-up of five percent (5%) or \$100,000, whichever is less shall be applied to the aggregate of sub-tier subcontractor charges greater than \$650,000.
 - (c) For parties performing the Work, overhead and profit on changes shall be calculated not to exceed the following: ten percent (10%) overhead and ten percent (10%) profit on total direct costs up to \$25,000; seven and one-half percent (7 ½%) overhead and seven and one-half percent (7 ½%) profit on total direct costs over \$25,000.00, but less than \$650,000; five percent (5%) of total direct costs or \$100,000 whichever is less, for overhead and profit combined on total direct costs over \$650,000.
 - (d) Overhead and profit shall be calculated utilizing the net increase in price of the change after deductions have been taken.
 - (e) Credit for overhead and profit shall be included as part of the downward adjustment for a deductive change.
- 3.5.6 Any change in excess of \$650,000 will require cost and pricing data as part of the proposal for the change.

4.0 THE SUBCONTRACTOR

SC 4.1 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

- 4.1.1 Within ten (10) working days of Subcontract execution and prior to commencement of any Work, SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.
- 4.1.2 Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the Work.

SC 4.2 RESERVED

SC 4.3 SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES

- 4.3.1 SUBCONTRACTOR shall submit drawings, data, samples, and other submittals in accordance with Exhibit "I", "Subcontractor Submittal Requirements Summary," of this Subcontract.

CONTRACTOR will require a fourteen (14) calendar day review period for drawings, data, samples, and other submittals.

4.3.2 Review and permission to proceed by CONTRACTOR, as stated in this Special Condition, does not constitute acceptance or approval of design details, calculations, analyses, test methods, certificates, or materials developed or selected by SUBCONTRACTOR and does not relieve SUBCONTRACTOR from full compliance with contractual obligations. Drawing categories and their associated requirements include, but are not limited to, the following:

4.3.2.1 Issued for Construction (IFC) Drawings may be required for:

- Fabrication of SUBCONTRACTOR-furnished equipment,
- Installing SUBCONTRACTOR-furnished material or equipment,
- Planning and performance of the Work under this Subcontract
- Installing energized utility systems.

IFC drawings shall be prepared by the SUBCONTRACTOR in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." The drawings shall be submitted by and at the expense of SUBCONTRACTOR before fabrication, installation, or performance is commenced, allowing at least fourteen (14) calendar days for review by CONTRACTOR unless otherwise shown on the Subcontract Schedule. IFC drawings submitted by the SUBCONTRACTOR and reviewed by CONTRACTOR shall form a part of this Subcontract. Such drawings shall include, but not be limited to, matchmarks, erection diagrams, and other details, such as field connections for proper installation, erection of the equipment, and performance of the Work.

Drawings submitted by SUBCONTRACTOR shall be certified by SUBCONTRACTOR to be correct, shall show the Subcontract number, and shall be furnished in accordance with the Subcontract Submittal Requirements Summary (SSRS) form(s).

Design changes to the IFC drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.2 Samples:

Samples, if required, shall be submitted by and at the expense of SUBCONTRACTOR. Such submittals shall be made not less than thirty (30) calendar days before the time that the materials represented by such samples are needed for incorporation into the Work. Samples shall be subject to review and materials represented by such samples shall not be manufactured, delivered to the Jobsite, or incorporated into the Work without such review.

Each sample shall bare a label showing SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, brand name, model number, supplier's name, and reference to the appropriate drawing number, technical specification section and paragraph number, as applicable.

Samples that have been reviewed may, at CONTRACTOR'S option, be returned to SUBCONTRACTOR for incorporation into the Work.

4.3.2.3 Data and Certificates:

Four (4) copies of each required certificate shall be submitted by and at the expense of SUBCONTRACTOR. Such submittal shall be made not less than thirty (30) calendar days before the time that the materials represented by such certificates are needed for incorporation into the work. Certificates shall be subject to review, and material represented by such certificates shall not be fabricated, delivered to the jobsite, or incorporated into the Work without such review.

Certificates shall clearly identify the material being certified and shall include, but not be limited to, providing the following information: SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, and reference to the appropriate drawing, technical specification selection and paragraph number, as applicable.

4.3.2.4 Working Drawings and Design Changes:

During construction, the SUBCONTRACTOR shall keep an up-to-date set of working drawings on the jobsite as an accurate record of deviations between Work as shown on the IFC drawings and Work as installed. These drawings shall be available to CONTRACTOR and OWNER for inspection. The working drawings, including any initial as-built drawings, shall be available for inspection at the SUBCONTRACTOR's field office at the jobsite.

Design changes to the IFC drawings, including the redlining process, shall be made in accordance with the Technical Specification 000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.5 As-Built Drawings:

The SUBCONTRACTOR shall provide the as-built information submittals as described below and as detailed in Exhibit I.

4.3.2.5.1 Required Submittals. The SUBCONTRACTOR shall, at its expense, furnish to the CONTRACTOR the following submittals:

- Initial as-built drawings for energized utility systems. Drawings shall show the energized utility system configuration at the time it was placed into service.
- Final as-built drawings for all IFC and initial as-built drawing.

The content, level of detail, accuracy of location and format of the as-built drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." Design change process for initial as-built and final as-built drawings shall be in accordance with Technical Specification 0000X-SP-X0001.

4.3.2.5.2 Submittal Schedule. SUBCONTRACTOR shall furnish the as-builts drawing submittals in accordance with the schedule below:

- Initial as-built drawing for electrical utility systems – Due not later than thirty (30) calendar days after final energization of the system.
- Initial as-built drawings for non-electrical utility systems – Due not later than thirty (30) calendar days after installation is complete. CONTRACTOR approval of the as-built submittal is required prior to using the non-electrical utility.
- Final as-built drawings for all work including energized utility systems due not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment.

4.3.2.6 As-Built Specifications:

SUBCONTRACTOR shall, at its expense and not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment, furnish to CONTRACTOR a complete set of marked-up, final as-built specifications with FINAL AS-BUILT clearly printed on the cover and associated electronic file. SUBCONTRACTOR shall accurately and neatly transfer all annotations from progress as-builts to final as-builts.

Deviations from specifications must be supported by Request for Information (RFI), Supplier Deviation Disposition Request (SDDR), or Design Change Notice (DCN).

4.3.2.7 Electronic Files:

As-built drawings submittals shall be prepared using acceptable and compatible software as determined by the CONTRACTOR. Submittal documents shall be delivered in the quantities as specified in Exhibit I and accompanied by an electronic media version.

4.3.2.7.1 Specifications: Textual material shall be converted to Microsoft Word and shall have a ".doc" extension.

4.3.2.7.2 Drawings: Design drawings shall be prepared by SUBCONTRACTOR in accordance with Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.8 Energized Systems:

Energized systems include, but are not limited to, the following:

- Electric Power and Control Systems (except telephone and computer systems)
- Pressurized piping systems
- Sanitary and process sewer systems

The SUBCONTRACTOR shall submit approved design and "as-built" information for energized systems (including detailed routing of above and below grade components) to the WCH Project Engineer as described above in the titled section "As-built Drawings." For electrical utility installations, the SUBCONTRACTOR shall have a "Hold Point" clearly stated in their work procedures/instructions requiring an NEC Inspection prior to final energizing of the affected system(s). The SUBCONTRACTOR shall have the current up-to-date working drawings for the system available for the NEC inspector's use. The final energization inspection shall only be undertaken by the NEC inspector if the working drawings are current and correctly show the configuration of the work to be inspected.

SC 4.4 COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK

4.4.1 SUBCONTRACTOR shall complete the Work under the Subcontract to meet the following Subcontract Milestones measured in calendar days from Notice to Proceed (NTP) with on-site Work of the Subcontract:

ERDF CELLS 9 & 10 CQA			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Complete Mobilization Submittals	Subcontract Award	30
2.	Submit Cell 9 Final Certification Report	Subcontract	4/01/2011

		Award	
3.	Submit Cell 10 Final Certification Report	Subcontract Award	9/01/2011
4.	Complete Demobilization	Subcontract Award	9/29/2011

CONTRACTOR will make available to the SUBCONTRACTOR the construction schedule provided by the ERDF Construction Subcontractor within 25 days after the award of ERDF Construction Subcontract. The SUBCONTRACTOR shall plan and ensure adequate resources are available in accordance with this schedule.

The following milestones were set by CONTRACTOR for the ERDF Construction Subcontract. SUBCONTRACTOR shall use these milestones only for bidding and resource planning purposes.

ERDF CELLS 9 & 10 CONSTRUCTION			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Submit Bonding and Insurance	Subcontract Award	10
2.	Complete Mobilization Submittals	Subcontract Award	30
3.	Cell 9 Excavation	Per S/C schedule	4/1/2010
4.	Admix Test Pad	Per S/C schedule	4/15/2010
5.	Complete Cell 10 North and South Embankments	Per S/C schedule	6/1/2010
6.	Cell 9 Admix Placement	Per S/C schedule	7/12/2010
7.	Cell 10 Excavation	Per S/C schedule	8/1/2010
8.	Remove Covers and Clean Existing Leachate Tanks	Per S/C schedule	8/1/2010
9.	New Covers on Existing Leachate Tanks	Per S/C schedule	10/1/2010
10.	Cell 9 Liner & Leachate Collection Systems	Per S/C schedule	10/1/2010
11.	Cell 10 Admix Placement (Admix Placement South of Sump and Admix Winter Protection)	Per S/C schedule	11/1/2010
12.	Cell 9 Operations Layer	Per S/C schedule	11/15/2010
13.	Revegetate Stockpiles	11/1/2010	12/31/2010
14.	Cell 9 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	12/1/2010
15.	Leachate Transmission Pipeline (pipeline, manholes, electrical)	Per S/C schedule	2/1/2011
16.	Leachate Tank No. 3	Per S/C schedule	2/1/2011
17.	Cell 9 Acceptance Testing	Per S/C schedule	3/1/2011
18.	Cell 10 Admix Placement (Admix Placement in Sump and North Slope & Remove Winter Protection)	Per S/C schedule	4/1/2011
19.	Cell 10 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	4/1/2011
20.	Cell 10 Liner & Leachate Collection Systems	Per S/C schedule	7/1/2011
21.	Cell 10 Operations Layer	Per S/C schedule	9/1/2011
22.	Cell 10 Acceptance Testing	Per S/C schedule	8/1/2011

- 4.4.2 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR to take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the Subcontract Milestones set forth above, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of work per week, expedited shipment(s) of equipment and materials, and an increase in the amount of construction plant and equipment, without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of work and rate of progress required by this Subcontract.
- 4.4.3 Noncompliance with CONTRACTOR'S instructions shall be grounds for CONTRACTOR'S determination that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate this Subcontract pursuant to the General Condition clause titled "TERMINATION FOR DEFAULT."

SC 4.5 SUBCONTRACT SCHEDULE

- 4.5.1 SUBCONTRACTOR shall, within fifteen (15) calendar days of Subcontract award, submit to CONTRACTOR for approval the Subcontract Schedule consisting of a detailed schedule meeting the milestone dates established in the Special Condition titled "COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK." This approved Subcontract schedule is the Project Baseline Schedule. No progress payments will be made until the SUBCONTRACTOR'S schedule has been accepted by the CONTRACTOR and annotated as a Status "1". The Subcontract Schedule shall be based on a critical path analysis of activities (as applicable) and sequence of operations needed for the orderly performance and completion of any separable parts of and all the Work in accordance with this Subcontract. The Subcontract Schedule shall be a resource loaded Critical Path Method (CPM) type in the form of a precedence diagram and activity listing. The schedule shall contain sufficient detail to identify critical schedule activities, CONTRACTOR interface, submittals required, inspection points, deliverables, and any other information pertinent to the performance of this Subcontract.
- 4.5.2 The Subcontract Schedule shall show in detail and in order of sequence, all activities, their descriptions, durations, production rate variances and dependencies, necessary and required to complete the Work, and any separable parts thereof. In addition to Milestones shown in SC 4.4.1 the following (minimum) list shall be included as specific activities:
- 4.5.3 The activity listing shall show the following information for each activity on the Subcontract Schedule:
1. Identification by activity numbers and descriptions
 2. Craft (manpower) and equipment resource loaded activity sheets for Project Baseline Schedule
 3. Early start and finish dates
 4. Late start and finish dates
 5. Identify any float time
 6. Identify and describe any suspension of work, if applicable
- 4.5.4 The Subcontract Schedule shall be complete, covering activities at the Jobsite, off-site activities such as design, fabrication, procurement and jobsite delivery of SUBCONTRACTOR-furnished

equipment, and the scheduled Jobsite delivery dates of equipment to be furnished by CONTRACTOR, if any, and shall include a personnel forecast by crafts. SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans (resources, production rates, logistics/methodology, requirement for Radiological Control Technicians (RCTs), and CONTRACTOR deliverables) required for performing each separable part of Work.

- 4.5.5 The Subcontract schedule and revisions must be submitted in an electronic format compatible with Primavera Project Planner, Version 2.0 or later industry updates (WINDOWS) or as coordinated with CONTRACTOR. SUBCONTRACTOR shall promptly inform CONTRACTOR of any proposed change in the schedule and narrative and shall furnish CONTRACTOR with a revised schedule and narrative within ten (10) calendar days after approval by CONTRACTOR of such change.
- 4.5.6 The schedule and narrative shall be kept up to date, taking into account the actual Work progress and shall be revised, if necessary, every thirty (30) calendar days. The revised schedule and narrative shall, as determined by CONTRACTOR, be sufficient to meet the requirements to complete the separable parts of any and all of the Work, as set forth in this Subcontract.
- 4.5.7 During the performance of the Work, SUBCONTRACTOR shall submit to CONTRACTOR periodic progress reports in duplicate on the actual progress. Such reports shall be furnished as CONTRACTOR may request.
- 4.5.8 Such progress reports shall include the following:

- 1. Quarterly Chemical Inventory, (See Exhibit G and Exhibit J)
- 2. Monthly Accident and injury report summary, as required by Exhibit "A". General Condition titled SAFETY AND HEALTH, and Exhibit "G" Subcontractors Safety and Health Requirements, titled "Reporting Accidents and Incidents".
- 3. Monthly A copy of the Subcontract Schedule outlining progress to date for the major parts of the Work, as compared to scheduled progress, no later than the end of the month.
- 4. Monthly A comparison between planned and actual personnel by craft for Work performed to date, as required by CONTRACTOR.
- 5. Monthly A detailed and complete financial report in spreadsheet format showing as a minimum, current month. Past months, future month projections of pay item billings, percents of work complete by pay item no later than 10 working days after the end of each month.
- 6. Weekly A three-week look-ahead schedule showing forecast personnel by craft (if different from the original construction plan).
- 7. Weekly A three-week look-ahead schedule showing forecast progress of the Work, detailing discreet elements of work within each subcontract schedule activity, including forecast of personnel by craft, as required by CONTRACTOR.
- 8. Weekly A weekly report of quantities completed on items of the Work, as required by CONTRACTOR.
- 9. Weekly A weekly update of the estimate of labor hours for each activity or operation, as

required by CONTRACTOR.

10. Daily A daily force report listing all personnel by craft and Work performed by them,

SC 4.6 RESERVED

SC 4.7 SECURITY AND HAZARD COMMUNICATION PROGRAMS

- 4.7.1 A Security Program shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any event prior to commencing Work at the Jobsite. Such Program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, and shall include:

4.7.1.1. Controlled access to office, warehouse, material and equipment sites.

4.7.1.2 Accountability procedures for the requisition and issue of materials.

4.7.1.3 Periodic security checks for all work areas assigned to SUBCONTRACTOR.

4.7.1.4 Prompt reporting of incidents of loss, theft or vandalism to CONTRACTOR, subsequently detailed in writing.

4.7.1.5 Coordination and compliance with Site security programs.

- 4.7.2 A Hazard Communication Program shall be submitted in writing to the CONTRACTOR for approval and coordination with other jobsite activities within thirty (30) days after Subcontract award or prior to commencing work at the Jobsite. Such program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, (See Exhibit "G", Safety and Health Requirements), and shall include Identification of Hazard Communication Program responsibility and accountability. The Hazard Communication Program shall ensure:

4.7.2.1 Receipt and document control of Material Safety Data Sheets (MSDS) for materials being brought onto the Jobsite by the SUBCONTRACTOR or its suppliers and subtiers.

4.7.2.2 Employee training on MSDS's and in the handling and disposal of materials that fall under statutory regulations.

4.7.2.3 A disposal plan for removal of hazardous materials from the Jobsite. This plan must meet all federal/national, state and other applicable governmental requirements.

- 4.7.3 Subcontractor and all of Subcontractor's lower-tier subcontractors shall identify supervisory point(s) of contact (POCs) that will be on site whenever Subcontractor's/or lower-tier subcontractor's personnel are on site. The POC is responsible for notifying Subcontractor's personnel when an "Event Notification" occurs.

Event Notification will be broadcast on the WCH Intranet and via text messages to all POCs. The POC shall carry a cell phone at all times that is capable of sending and receiving text messages and the cell phone number shall be provided to the STR and kept up-to-date at all times.

SC 4.8 RESERVED

SC 4.9 SUBCONTRACTOR KEY PERSONNEL

- 4.9.1 CONTRACTOR reserves the right to approve all Key Personnel. SUBCONTRACTOR'S key personnel must be assigned full-time onsite to this Subcontract exclusively and possess the minimum qualifications listed below. SUBCONTRACTOR shall not reassign or remove key personnel without prior written authorization of CONTRACTOR. Whenever, for any reason, one or more of these individuals are unavailable for assignment for Work under this Subcontract, any replacement key personnel shall possess the minimum qualifications and experience required for the position.
- 4.9.2 When the CONTRACTOR finds that a correlation exists or appears to exist between a documented lack of SUBCONTRACTOR performance and a lack of SUBCONTRACTOR employee qualification performance and/or falsification of experience requirements, the SUBCONTRACTOR agrees to immediately replace that individual with another employee with the minimum qualifications appropriate to the work being performed as specified above at no additional cost to the CONTRACTOR.

CQA OFFICER

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.1 requirements.

CQA ENGINEER AND PROJECT MANAGER (FULLTIME ON SITE POSITION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.2 requirements.

BENTONITE ADMIX LANDFILL LINER CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING ADMIX PUGMILL SET UP, TEST PAD, OPERATION, AND PLACEMENT)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

GEOSYNTHETICS CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING GEOSYNTHETICS INSTALLATION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

SC 4.10 RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE

- 4.10.1 SUBCONTRACTOR shall not schedule materials and/or equipment for delivery to the Jobsite until such time as it is mobilized to receive and accept property at the Jobsite. CONTRACTOR reserves the right to require survey of any materials/equipment for presence of hazardous or radioactive substances before bringing the equipment/material into or from the Jobsite. Any deficiencies shall be corrected or replaced at SUBCONTRACTOR'S expense.
- 4.10.2 SUBCONTRACTOR is not permitted to use CONTRACTOR'S mailing address and in no case shall material or equipment be addressed in care of CONTRACTOR. It is recognized that special conditions may exist that would warrant assistance in the delivery of equipment or materials by CONTRACTOR. However, the SUBCONTRACTOR must have explicit prior written authorization from CONTRACTOR.

SC 4.11 RESERVED

5.0 THE CONTRACTOR

SC 5.1 CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS

- 5.1.1 CONTRACTOR will furnish specifications and design drawings for each part of the Work under this Subcontract. SUBCONTRACTOR shall, immediately upon receipt thereof, check all specifications and drawings furnished and shall promptly notify CONTRACTOR of any omissions or discrepancies in such specifications or drawings.
- 5.1.2 All specifications and drawings listed in Exhibit "E", SPECIFICATIONS and Exhibit "F", DRAWINGS are a part of this Subcontract. "Issued for Award" (IFA) specifications and drawings will be issued at the time of award and become a part of the Subcontract, superseding or supplementing the original drawings. SUBCONTRACTOR shall perform Work only in accordance with drawings marked IFA. If SUBCONTRACTOR considers such issue to be a change affecting cost or schedule, SUBCONTRACTOR must request an equitable adjustment in accordance with the General Condition titled "CHANGES."
- 5.1.3 SUBCONTRACTOR shall perform Work only in accordance with IFA drawings and any subsequent revisions thereto, and with CONTRACTOR reviewed drawings submitted by SUBCONTRACTOR in accordance with the Special Condition titled "SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES."
- 5.1.4 The CONTRACTOR shall maintain control of all electrical drawings. The SUBCONTRACTOR shall provide appropriate design and as-built to the CONTRACTOR for incorporation into the drawings.
- 5.1.5 One (1) copy of such specifications, and One (1) full size reproducible copy, and One (1) full size prints of such drawings will be furnished to SUBCONTRACTOR without charge. Any additional copies of such specifications and drawings will, upon SUBCONTRACTOR'S request, be furnished to SUBCONTRACTOR at the actual cost thereof.

SC 5.2 CONTRACTOR-FURNISHED UTILITIES AND SERVICES

- 5.2.1 Utilities. The utilities listed below and specifically detailed in the Specifications or Statement of Work, as applicable, will be furnished by CONTRACTOR without cost to SUBCONTRACTOR, provided that all such utilities will be furnished at outlets existing on the Jobsite and SUBCONTRACTOR shall, at its expense, extend such utilities from said outlets to points of use and at completion of all the Work remove all materials and equipment used for such extensions.
 - 5.2.1.1 Water for construction
 - 5.2.1.2 Potable water
 - 5.2.1.3 Electrical services
 - 5.2.1.4 Telecommunication lines
- 5.2.2 Services. The CONTRACTOR shall determine whether the services listed below, if required under this Subcontract, will be furnished by CONTRACTOR to support performance of Work by SUBCONTRACTOR.
 - 5.2.2.1 Services of Non-Building Trades, bargaining craft Radiological Control Technicians (RCTs) who are members of the Hanford Atomic Metals Trades Council (HAMTC) to perform radiological monitoring.

5.2.2.2 CONTRACTOR will provide Radiological Dosimetry Services and Records, and Occupational Medical Services and Records.

5.2.3 Facilities. The facilities listed below will be furnished by CONTRACTOR. Such facilities may be used by SUBCONTRACTOR without charge therefore, provided that any such use will be subject to written approval of CONTRACTOR.

5.2.3.1 Office and Laboratory Testing Trailer with the following characteristics:

- Three offices (12' x 9' minimum)
- Laboratory space (21x16 space and including shelving). Electrical outlets will be provided in each office area, hallways, and at least six 110v outlets and one 220v outlet will be provided in the laboratory area.
- Daily janitorial service (trash service, vacuuming, mopping, etc.) provided by the CONTRACTOR.
- Office/lab trailer utilities (HVAC, electrical, etc.) will be provided and maintained by CONTRACTOR.

5.2.3.2 Temporary toilet facility with separate areas for males and females.

5.2.3.1 Jobsite parking area – The CONTRACTOR will designate an area near the operation for SUBCONTRACTOR personnel vehicle parking.

SUBCONTRACTOR shall be responsible for testing equipment, office supplies (copiers, computers, consumables, internet service, telecommunications, etc.), and furniture (including flammable storage cabinets).

SC 5.3 CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT

5.3.1 CONTRACTOR will furnish to SUBCONTRACTOR, at CONTRACTOR'S warehouse or Jobsite storage area, the items listed below to be incorporated into or used in performance of the Work under this Subcontract. Such items will be furnished, without cost to SUBCONTRACTOR, provided that SUBCONTRACTOR shall, at its expense, accept delivery thereof, load, unload, transport to points of use and care for such items until final disposition thereof. At time of acceptance of any such item from CONTRACTOR, SUBCONTRACTOR shall sign a receipt therefore. Signing of such receipt without reservation therein shall preclude any subsequent claim by SUBCONTRACTOR that any such items were received from CONTRACTOR in a damaged condition and with shortages. SUBCONTRACTOR shall account for such material and equipment in accordance with FAR 52.245.1 (June 2007). If at any time after acceptance of any such item from CONTRACTOR any such item is damaged, lost, stolen, or destroyed, such item shall be repaired or replaced at the expense of SUBCONTRACTOR. Items required to be replaced may, at its option, be furnished by CONTRACTOR. Upon completion of all the Work under this Subcontract, SUBCONTRACTOR shall, at its expense, return all surplus and unused items to CONTRACTOR'S warehouse or Jobsite storage area.

5.3.2 CONTRACTOR will exert every reasonable effort to make delivery of such materials and equipment so as to avoid delay in the progress of the Work. However, should CONTRACTOR, for any reason, fail to make delivery of any such item and a delay shall result, SUBCONTRACTOR shall be entitled to no additional compensation or damages on account of such delay. The only adjustment that will be made will be the granting of an appropriate extension of time.

SC 5.4 CONTRACTOR-FURNISHED PERMITS

The General Condition titled "PERMITS AND LICENSES" notwithstanding, CONTRACTOR will without cost to the SUBCONTRACTOR; furnish the permits required for performance of work on the Hanford Site. SUBCONTRACTOR shall, in accordance with said General Condition titled "PERMITS AND LICENSES", provide all other permits. All such CONTRACTOR-furnished permits are available for examination at the project office of CONTRACTOR during regular business hours.

SC 5.5 AUTHORITY OF PERSONNEL

- 5.5.1 The CONTRACTOR will designate a Subcontract Specialist to administer the Subcontract terms and conditions and act as the CONTRACTOR'S authorized representative. Additionally, all correspondence shall be issued and received by the designated Subcontract Specialist. Unless further delegated, in writing, by the Subcontract Specialist as set forth below, the only individual authorized to direct the SUBCONTRACTOR to deviate from the express, written terms of the Subcontract is the authorized Subcontract Specialist.
- 5.5.2 The CONTRACTOR will designate a Subcontract Technical Representative (STR) who will be responsible for the technical aspects of the performance of the Subcontract. The STR may designate other personnel to oversee the performance of the Work, sign field tickets, etc. However, the designated STR retains ultimate authority over the technical aspects of the Work. Should the SUBCONTRACTOR and STR disagree over the technical requirements of the Subcontract; such matters will be immediately referred to the CONTRACTOR'S Subcontract Specialist for resolution. Subcontract Specialist may advise SUBCONTRACTOR of further delegation of his/her authority as set forth above. Unless so advised, STR does not possess authority, express or implied, to direct the SUBCONTRACTOR to deviate from the terms and conditions of the Subcontract.

SC 5.6 DISPOSITION OF CONTAMINATED PROPERTY

- 5.6.1 The SUBCONTRACTOR is expected to bring equipment that is readily decontaminated. The SUBCONTRACTOR agrees to submit to CONTRACTOR for survey any equipment, tools, or other personal property brought into any Radiological Areas by the SUBCONTRACTOR, its employees, and any of its subcontractors and their employees.
- 5.6.2 The necessary survey to detect contamination will be performed immediately before removing any property from any location within the Jobsite Controlled Access Area or area specified by the CONTRACTOR. The SUBCONTRACTOR shall notify CONTRACTOR not less than three (3) working days before each property (including equipment and tools) removal.
- 5.6.3 The CONTRACTOR'S intent is to work with the SUBCONTRACTOR to release all SUBCONTRACTOR'S equipment through the efforts of equipment placement (minimization of contact) and decontamination efforts on affected equipment pieces (i.e., buckets, tracks, beds). Because of the known inventory of constituents within the excavation areas, CONTRACTOR cannot guarantee the full release of SUBCONTRACTOR'S equipment or parts thereof.
- 5.6.4 Any equipment, except for treatment equipment designed and intended to come into direct contact with contaminated material, that cannot be decontaminated or free released (radiological) in a timely manner will not be released back to the SUBCONTRACTOR and becomes the property of the CONTRACTOR/OWNER. At the sole discretion of the CONTRACTOR, additional compensation to the SUBCONTRACTOR may be made for the contaminated equipment.

5.6.5 In any event, the SUBCONTRACTOR shall be responsible for all CONTRACTOR and SUBCONTRACTOR costs incurred when contamination of equipment/material results from violation of CONTRACTOR'S Radiological Control Program.

5.6.6 Prior to release of any equipment, SUBCONTRACTOR shall consult with CONTRACTOR to determine whether decontamination is necessary.

6.0 GENERAL SUBCONTRACT PROVISIONS

SC 6.1 WORK HOURS AND FACILITY CLOSURE DAYS

6.1.1 Site Work Hours

6.1.1.1 Site Work hours are from 6:00 a.m. to 4:30 p.m. Monday through Friday (5 days per week, 10/hours per day). SUBCONTRACTOR shall be onsite when the Construction Subcontractor is performing work requiring Construction Quality Assurance (CQA) oversight. Deviation from the approved Site work hours shall be requested in writing from the CONTRACTOR and such approval shall not be unreasonably withheld, but shall be at the Contractor's discretion. The Subcontractor should plan to observe the same facility closure days as the CONTRACTOR.

CONTRACTOR recognizes the following Facility Closure days:

New Year's Day	Labor Day
*Presidents Day	Thanksgiving Day
Memorial Day	Day before Thanksgiving
Independence Day	Christmas Day
*Day before or after Christmas	

*Facility closure is not applicable to Building Trades Craft

Note: In the event a Facility Closure Day falls on a weekend (Friday, Saturday, or Sunday), it will be observed on an otherwise scheduled work day.

6.1.1.2 SUBCONTRACTOR is responsible for contacting the Subcontract Technical Representative with support requirements on Facility Closure dates with a 72-hour advance written notice to the CONTRACTOR. The SUBCONTRACTOR shall not perform any work at the jobsite on any Facility Closure Day without CONTRACTOR approval in advance.

6.1.1.3 SUBCONTRACTOR shall take into consideration that the above work schedule may be deviated from based upon the official Department of Energy, Richland Operations Office (RL) process for declaring changes to the Hanford Site work schedule due to inclement weather conditions. SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the general and local conditions, including, but not limited to, climatic conditions and seasons.

6.1.2 Notification System

There are three primary methods used to notify employees and subcontractors when site conditions necessitate a site closure, delay in the start of work, or early release from work.

6.1.2.1 Subcontractor employees may request their Subcontract Specialist or Subcontractor Technical Representative submit their name, cell phone number, and cell phone provider to the WCH text messaging notification system. In the event there are site

closures, for any reason, the recipient will receive a text message providing the information.

6.1.2.2 Subcontractor employees may refer to the WCH External Website. In the event of delays or site closures, a banner will be posted on the website.

6.1.2.3 Subcontractor employees may phone 372-9002 for emergency or site closure information.

6.1.3 Variable Conditions May Affect Site Areas Differently

6.1.3.1 Due to the size of the Hanford Site, adverse weather conditions may affect separate parts of the site differently. In these cases, the work delay/early release may only apply to those employees and/or Subcontractors working in the most affected areas. In the event a project needs an individual to be present onsite during adverse weather, CONTRACTOR shall notify SUBCONTRACTOR.

6.1.3.2 When the start of work is delayed due to inclement weather conditions, the adjusted start time is intended to give employees and/or Subcontractors adequate time to arrive at work safely. Arriving ahead of the adjusted start time could jeopardize the completion of maintenance work, and could put the employee at risk in terms of unsafe road conditions and/or unsafe walking surfaces at the work place. If a decision is made for an early release of employees and/or Subcontractors from work due to severe weather conditions, the CONTRACTOR will notify the SUBCONTRACTOR.

SC 6.2 WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL

6.2.1 Working Hours:

The SUBCONTRACTOR shall not perform Work at the Jobsite on other than the Site Work hours specified in subparagraph 6.1.1 above, unless it has given prior written notification to CONTRACTOR and has received approval in advance, as provided in this Special Condition.

6.2.2 Notification:

The SUBCONTRACTOR shall give CONTRACTOR at least four (4) hours prior notice if its employees are to be working after the site work hours specified in SC 6.1.1. The SUBCONTRACTOR shall give CONTRACTOR notice on the prior working day if its employees will be working before the site work hours specified in SC 6.1.1, or will be working at any time on Saturday, Sunday, or holidays. The notice shall include the type of Work to be performed, location of Work, date and hours of Work, and description of any heavy equipment to be used. CONTRACTOR advance approval is required any time Work is to be performed at other than normal shift periods.

SC 6.3 SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION

The Subcontract Performance Period shall commence on the date of Award of the Subcontract and extend through and including September 30, 2011.

SC 6.4 INCREMENTAL FUNDING OF SUBCONTRACT

The CONTRACTOR'S obligation to pay the Subcontract price in accordance with Section entitled, "Measurement for Payment and Payment for Work", of the Subcontract Special Conditions is subject to the provisions and limitations further set forth by the following. The CONTRACTOR'S obligation under this

Subcontract is hereby limited notwithstanding any provision of the "Measurement for Payment and Payment for Work" section or any other section or provision of this Subcontract.

- 6.4.1 Allotment of Funds: Of the total Subcontract price, only specific portions of the total amount are estimated to be available, allotted by FY, for this Subcontract. The CONTRACTOR shall not be obligated under this Subcontract to the SUBCONTRACTOR on any theory or basis for total payment in excess of total allotments up to that time. Furthermore, the SUBCONTRACTOR is not to expend any effort on Work for which the CONTRACTOR has not provided the SUBCONTRACTOR written authorization to proceed.

CONTRACTOR shall notify SUBCONTRACTOR of the estimated amount of funding to be available for each subsequent FY. It is contemplated, but not warranted, that the full amount of estimated funds for each FY's allotment will be available by October 1st, of each FY. CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the exact amount of each FY allotment of funds as soon as such becomes known.

6.4.2 Schedule:

6.4.2.1 The SUBCONTRACTOR agrees to schedule and perform or have performed the contract work in such a manner as to ensure that, in the event of termination of this contract pursuant to Subcontract General Conditions, Clause, "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) would not exceed the total amount allotted at the time to the Subcontract. The CONTRACTOR shall not be obligated in any event to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this subcontract, anything to the contrary or any other provision of this Subcontract notwithstanding.

6.4.2.2 To insure compliance with the requirements of subparagraph 6.4.2.1 above, all schedules required elsewhere in this Subcontract shall relate to and describe the SUBCONTRACTOR'S proposed plan for performance of work and representation of work actually performed to the amount then allotted to this Subcontract. Furthermore, SUBCONTRACTOR shall schedule and relate planning for future performance of Work to the estimated allotments to this Subcontract referenced in subparagraph 6.4.1, above.

- 6.4.3 Notices – Actions When Costs Approach Total Amounts Allotted: Until such time as the CONTRACTOR has allotted funds up to the full Subcontract price, including any adjustments thereto, the SUBCONTRACTOR shall notify the CONTRACTOR in writing 30 days in advance of the point when, in the event of termination of this Subcontract pursuant to the article hereof entitled "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) will approximate eighty-five percent (85%) of the total amount then allotted to the Subcontract. Upon receipt of such notice, the CONTRACTOR may take one of, or a combination of, the following actions:

6.4.3.1 Instruct the SUBCONTRACTOR to continue performance of the Subcontract to the extent permitted by the amount of funds then allocated to this Subcontract;

6.4.3.2 Increase the amount of funds allotted to the Subcontract and instruct the SUBCONTRACTOR to proceed with work not previously funded;

6.4.3.3 Order the SUBCONTRACTOR to suspend all or any part of the work in accordance with Subcontract General Conditions, "Suspension". If the suspension of work has resulted from the failure of the SUBCONTRACTOR to schedule and perform the Subcontract work in accordance with the provisions of subparagraph 6.4.2 above, the SUBCONTRACTOR shall not be entitled to an equitable adjustment in Subcontract price nor time, nor shall the costs of the suspension be allowable in any subsequent

termination of the Subcontract for the convenience of the CONTRACTOR, irrespective of the provisions of the "Suspension" article, the "Termination for Convenience" article, or any other section or provision of the Subcontract; or

- 6.4.3.4 Terminate the performance of all or part of the work under this Subcontract in accordance with the "Termination for Convenience" section; or
- 6.4.3.5 Direct the SUBCONTRACTOR to take such action, as is agreed by the parties in writing to be appropriate under the circumstances (provided such action does not exceed the total funds then allotted).
- 6.4.4 **SUBCONTRACTOR Excused From Further Performance:** Before the allotment of funds up to the total Subcontract price (including any adjustments thereto), when the SUBCONTRACTOR'S performance has reached the point at which in the event of exercise of the "Termination" section of this Subcontract, the total amount payable by the CONTRACTOR would equal 100% (one hundred percent) of the amount then allotted to this Subcontract, the SUBCONTRACTOR shall immediately notify the CONTRACTOR and shall make no further commitments or expenditures (except to meet existing commitments and liabilities). The CONTRACTOR shall not be obligated to pay the SUBCONTRACTOR an amount in excess of the total amount then allotted to the Subcontract. If additional funds are not allotted by the date set forth in subparagraph 6.4.1 above, or such later date as may be agreed to by both parties, the SUBCONTRACTOR shall not be obligated to continue performance under this Subcontract and the CONTRACTOR will, upon written request of the SUBCONTRACTOR, terminate the Subcontract pursuant to the provisions of the "Termination for Convenience" article, provided, however that in no event shall the CONTRACTOR be obligated to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this Subcontract.
- 6.4.5 If the SUBCONTRACTOR incurs additional costs or is delayed in the performance of the work under this Subcontract solely by reason of the failure of the CONTRACTOR to allot additional funds in accordance with the subparagraph 6.4.1 above, and if additional funds are allotted, equitable adjustments shall be made in Subcontract price and performance time.
- 6.4.6 The CONTRACTOR may at any time prior to termination, and with the consent of the SUBCONTRACTOR after notice of termination, allot additional funds to this Subcontract.
- 6.4.7 Nothing in this clause shall affect the right of the CONTRACTOR to terminate this Subcontract pursuant to the article of this Subcontract entitled, "Termination for the Convenience of the Government".
- 6.4.8 **Change Orders:** Changes issued pursuant to Subcontract General Conditions, "Changes", shall not be considered authorization for the SUBCONTRACTOR to exceed the amount allotted to this Subcontract in the absence of a statement in the Change Order, or other written notice to the SUBCONTRACTOR, increasing the amount allotted to this Subcontract.

SC 6.5 TECHNICAL DIRECTION

- 6.5.1 The term "technical direction" is defined as: (1) directions to the SUBCONTRACTOR, which shift work emphasis between work areas, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to facilitate the Subcontract Scope of Work; (2) provision of written information to the Subcontract that assists in the interpretation of drawings, specifications or technical portions of the work description; and (3) review and approval of technical reports, drawings, specifications, and technical information to be delivered by the SUBCONTRACTOR to the CONTRACTOR under the subcontract.
- 6.5.2 Technical direction must be within the Scope of Work stated in the subcontract. Unless so delegated, CONTRACTOR'S Subcontract Technical Representative (STR) does not have the

authority to, and may not issue any direction which: (1) constitutes an assignment outside the Scope of Work; (2) constitutes a change as defined in the Subcontract Clause, "Changes"; (3) in any manner causes an increase or decrease in the total estimated subcontract cost, the fixed unit rates, if any, or the time required for subcontract performance; and (4) changes any of the expressed terms and conditions.

6.5.3 The SUBCONTRACTOR shall proceed promptly with the performance of technical direction issued by the CONTRACTOR'S STR in the manner prescribed by this article and within the authority under the provisions of this article. If, in the opinion of the SUBCONTRACTOR, any instruction or direction by the CONTRACTOR'S STR falls within one of the categories defined in subparagraph 6.5.2 above, the SUBCONTRACTOR shall not proceed, but shall notify the Subcontract Administrator in writing within ten (10) working days after receipt of any such instruction or direction and shall request the Subcontract Administrator to modify the Subcontract accordingly.

6.5.4 A failure of the SUBCONTRACTOR and Subcontract Administrator to agree that the technical direction is within the Statement of Work or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the clause entitled, "Disputes".

SC 6.6 TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY)

Business related travel for non-represented employees is not generally authorized. In the event travel is authorized, SUBCONTRACTOR shall comply with WCH procedures. All authorized travel will be reimbursed in accordance with the Federal Travel Regulations (FTRs). Additionally, the following clauses apply:

6.6.1 En Route Expenses:

6.6.1.1 Transportation via public carrier will be reimbursed up to the equivalent of least cost economy (refundable) air fare plus actual and reasonable expenses in traveling shortest and most direct route from traveler's home office, to Richland Washington or at other such locations and return, at request of CONTRACTOR. Meals and incidental expenses (M&IE) includes meals, laundry, tips and phone calls to reserve lodging accommodations. Reimbursement for local travel is not authorized.

6.6.1.2 Subcontractor shall be reimbursed for lodging, subsistence and miscellaneous expenses incurred by SUBCONTRACTOR when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR consistent with the limits as described in the Federal Travel Regulations (FTR) set forth in 41 Code of Federal Regulations (CFR), latest supplement. This bulletin specifies expense limits for all geographical areas of the United States.

6.6.2 Automobile Rental:

Car rental expenses incurred by the subcontractor when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR for actual and reasonable cost incurred, supported by receipts.

6.6.3 Personal Automobile:

Mileage costs via the most direct route will be reimbursed at the current Government travel regulation rate. No reimbursement will be provided for a second automobile. Total costs for this mode of transportation may not exceed the total allowances that would have been provided had the employee traveled by public air carrier (including expenses to/from the airport and the lodging and M&IE per diem. Reimbursement for receipted toll charges is allowed over and above the mileage and M&IE.

6.6.4 Lodging, Meals, and Incidental Expenses:

6.6.4.1 Reimbursement for Temporary Assignment lodging, meals, and incidental expenses will be in accordance with the Lodging Plus methodology for the first thirty (30) days of assignment or until long-term lodging is obtained, whichever occurs first. After long-term lodging is obtained, or the thirty (30) day period has elapsed, the per diem allowance for lodging and meals and incidental expenses will be no more than seventy-five percent (75%) of the approved rate otherwise applicable.

6.6.4.2 Rental of a standard single apartment in the area, after long term lodging is obtained, or the 30-day period has elapsed, rent will be expensed via a Travel Expense Report. Proof of lodging, via receipts/copy of a signed lease agreement is required.

6.6.4.3 Subcontractors on single status assignments of three months or more may be granted trips home with approval, not to exceed a frequency of once every six weeks provided that a minimum of 30 days remain in the assignment. All travel shall be approved by the WCH STR based upon current work load.

Trips normally will be scheduled for weekends and will be on Subcontractor's time. Transportation and subsistence for trips home will be reimbursed subject to FTRs. If a Subcontractor elects to drive home, the amount may not exceed what the Subcontractor would have incurred for economy class round-trip airfare transportation home. Per Diem for M&IE is not paid during the "at-home" portion of a home leave. Lodging costs are not reimbursed for either the "en route" or the "at home" portion of home leave, however, lodging costs at the work location during home leave will be reimbursed if monthly rates are applicable.

6.6.5 Interruption of Per Diem:

During the per diem period, the meals/incidentals portion is forfeited in the following circumstances:

6.6.5.1 When Personal Time Off is taken in excess of two consecutive work days for reasons other than illness;

6.6.5.2 When Personal Time Off is taken for more than two consecutive days in conjunction with a weekend (e.g., Thursday, Friday, Weekend, Monday).

6.6.5.3 Any vacation period(s) taken in conjunction with travel including weekends or holidays taken in conjunction with vacation, and the periods covering return trips to the place of abode, are not reimbursable.

6.6.6 Other Provisions:

6.6.6.1 Receipts shall be provided substantiating travel expenses, lodging, rental cars, etc. Receipts are not required for meals and incidental expenses. Reimbursement for M&IE will not be made in excess of the maximum allowable daily totals.

6.6.6.2 This allowance shall be reduced on the first and last day of travel in accordance with the FTRs as follows:

Travel Duration	M&IE Reimbursement
Day of Departure	75% of Applicable M&IE Rate
Full day(s) of Travel	100% of Applicable M&IE Rate
Last Day of Travel	75% of Applicable M&IE Rate

6.6.6.3 Subcontractors on business travel in support of this Subcontract shall only be paid Labor Hours for travel during regular work hours. Any travel time paid in excess of 8 hours shall be paid at the regular straight time rate.

SC 6.7 INTEGRATED WORK CONTROL PROGRAM

Integrated Work Control (IWC) utilizes multi-disciplinary teamwork and worker involvement to support the identification, analysis, and mitigation of work site hazards; development of work packages; performance of work; and use of the observational approach for newly identified hazards. [10 CFR 851.21, and 22]. The work packages for construction of Cells 9 & 10 will be prepared by the Construction Subcontractor and will be developed and approved for release utilizing a graded approach based on risk and complexity of the work hazards and worker competence. [10 CFR 851.22].

The SUBCONTRACTOR's work performed within the Construction Subcontractor's work area shall be performed in accordance with the Construction Subcontractor's Integrated Work Control Program. The Integrated Work Control Program requirements are specified in Exhibit K.

SC 6.8 SAFETY INCENTIVE

6.8.1 Incentive

In addition to the need to protect the health and safety of the subcontractor's worker, the ability to maintain a safe and incident free work site ensures numerous financial benefits including a more productive work force, better relationships with the workers, lower insurance costs for subcontractors working, and few reports of incidents. The precise value of the items resulting from an accident at the site cannot be readily quantified. Therefore, the CONTRACTOR has allocated a quarterly financial incentive that allows the SUBCONTRACTOR the opportunity to earn an amount equal to Four Hundred Dollars (\$400.00) per eligible employee (computed in accordance with paragraph 6.8.3). Payment of incentive to SUBCONTRACTOR or sub-tier subcontractor employee is based on achieving zero OSHA Recordable Cases and OSHA Lost Work Day Cases (Days Away from Work, or restricted Work Days, or both), for WCH Hanford Site Work performed by SUBCONTRACTOR and SUBCONTRACTOR's sub-tier subcontractors as defined in paragraph 6.8.2 below.

6.8.2 Eligible Employees

6.8.2.1 Eligible SUBCONTRACTOR Employees are defined as any category of employee who works a minimum of three hundred (300) hours in any quarter for the SUBCONTRACTOR on a WCH project at the Hanford Site.

6.8.2.2 Eligible Sub-tier Subcontractor Employees are defined as any category of sub-tier subcontractor employee performing a minimum of three hundred (300) hours of long term field work during any calendar quarter when work is performed on a WCH Hanford Site project. Long term field work is defined a sub-tier subcontract work with a period of continuous performance in excess of six (6) months during the subcontract period of performance. The SUBCONTRACTOR will flow down the safety incentive to eligible sub-tier subcontractor employees meeting the criteria above.

6.8.3 Safety Incentive Periods and Computation

6.8.3.1 Initial Incentive Period – The Incentive Period will begin on the first day of the next month following the issue of approval by the CONTRACTOR for the SUBCONTRACTOR to mobilize at the Hanford Site. The first incentive payment will be pro-rated to the end of the current calendar year quarter.

6.8.3.2 Subsequent Incentive Periods – Subsequent Incentive Periods will be on a calendar quarter basis (January – March, April – June, July – September, or October – December) and continue through the end of the subcontract term. For a subcontract ending in mid-quarter, the incentive will be pro-rated based on the number of weeks completed in that quarter.

The recordable and Lost Work Day criteria and corresponding percentage of Safety Incentive earned are specified in the following table:

**Safety Performance Incentive Fee Schedule
Quarterly Safety Goals**

Safety Incident	One OSHA TRC recordable injury or illness (Medical Treatment or DART-Restricted Case)	Two OSHA TRC recordable injury or illnesses (Medical Treatment or DART-Restricted Case)	One OSHA recordable Lost Workday Case (Day Away DART-Day Away Case)	One or more OSHA TRC or DART Case(s) in each of two consecutive quarters
Reductions to Incentive Earned	Fifty percent (50%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive

Note: Failure to report an injury or accident, or the intentional and unauthorized altering of the scene of an injury or accident will result in a one hundred percent (100%) reduction of the quarterly incentive fee for two consecutive quarters.

6.8.3.3 Safety Incentive Payment – The Safety Incentive will be paid quarterly on the basis of four hundred dollars (\$400) per eligible employee per quarter to include sub-tier subcontractors as outlined above. The SUBCONTRACTOR will supply to the CONTRACTOR a listing of employees eligible to receive the incentive on a quarterly basis, which will establish the total potential amount of the incentive, subject to reductions as listed above. Subsequent to the distribution of incentive to employees in each quarter, SUBCONTRACTOR will provide to CONTRACTOR confirmation that the listed eligible employees received incentive payouts. An eligible employee is defined as a SUBCONTRACTOR employee that has worked for the SUBCONTRACTOR on a WCH project for a minimum of three hundred (300) hours in the quarter (See 6.8.2).

6.8.3.4 At SUBCONTRACTOR's discretion, a portion of the Safety Incentive may be retained for safety-related lunches, prizes, gifts, etc. for the benefit of the work force; however, it is expected that at least ninety percent (90%) will be passed along to SUBCONTRACTOR employees in the form of an equally distributed cash payout.

6.8.3.5 Where the SUBCONTRACTOR has an eligible sub-tier subcontractor, the total sub-tier subcontractor incentive amount will be based on four hundred dollars (\$400) per employee per quarter (see 6.8.2.2), minus any deductions outlined in the Safety Performance Incentive Fee Schedule. The SUBCONTRACTOR will inform the sub-tier subcontractor of the expectation to pass along at least ninety percent (90%) of the incentive to its employees in the form of equally distributed cash payouts.

SC 6.9 CERTIFIED PAYROLL

6.9.1 Except as noted below, SUBCONTRACTOR(S) shall strictly adhere to the provisions stated in the FAR Clause 52.222-8, "Payrolls and Basic Records (Nov 2009)," see Exhibit A, "Government Flowdowns."

6.9.1.1 Employee full Social Security Numbers and personal addresses shall not be included on Certified Payroll Submittals. The last four digits of the employee's Social Security Number shall be used to provide a uniquely identifiable number for each employee. The submittal of this information is considered Personal Identifiable Information which necessitates transmission with encryption software to be supplied by WCH. Subcontractor shall within thirty (30) days of award notify WCH with the names of the employees who will transmit the PII. WCH must be informed if the responsibility for transmitting the data changes to another employee.

6.9.1.2 SUBCONTRACTOR and lower tier subcontractors, shall ensure that employee personal information is readily available if requested by DOE-RL or the CONTRACTOR. Use of the Government's Certified Payroll form located at <http://www.dol.gov/whd/forms/wh347.pdf> is not required on condition that all information is provided on the form as set forth in FAR Clause 52.222-8.

DISTRIBUTION

	NAME	MISN	With Att.
X	Day, J.R.	T2-10	X
X	Howard, B.J.	T2-10	X
X	Klickovich, B.D.	T2-10	
X	Looney, D.	H4-17	X
	Melvin, W.F.	T2-10	
	Palmerheim, S.M.	H4-17	
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	X
X	Wintle, T.E.	T2-10	X
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

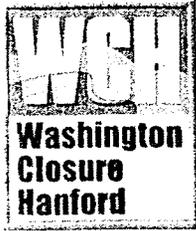
<u>Subcontract/No.</u>	<u>Change Notice</u>	<u>Description</u>
TradeWind, S012308A00	CN- _____	_____
DelHur, S010544A00	CN- _____	_____
W.Boos, 0600X-SC-G0524	CN- _____	_____
Envirotech, S013213A00	CN- 007	changes to Exhibit "B"

Comments:


 Distribution Completed: Yes: **X** No: Initials **DGT**

TO BE COMPLETED BY R&DC:

RECORD TYPE _____
 DATA ENTRY BY _____ SCANNED/# PGS _____
 REPRO BY _____ DOCS OPEN # _____



150665

June 10, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-006, REVISIONS TO THE CONSTRUCTION
SUBCONTRACT SPECIFICATIONS (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-006, *Revisions to the Construction Subcontract Specifications*.

If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

A handwritten signature in black ink, appearing to read 'Charles V. Skiba'.

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachments: (1) Change Notice CN-006
(2) TradeWind, LLC Change Notices CN-13 through CN-17



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655	
Subcontractor: Envirotech Engineers and Consultants, Inc.	Letter No.:	
Address: 2620 Fermi Ave., MSIN T2-11 Richland, WA 99354 Mr. Joe Voss, Project Manager	Effective Date: 06/09/10	
	Subcontract No.: S013213A00	
	Change Notice No.: 006	Page 1 of 12

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:
Revisions to the Construction Subcontract Specifications
[Funded by the American Recovery and Reinvestment Act of 2009 (ARRA)]:

For Your Records the ERDF Construction Subcontract has issued the following Change Notices (Attached) to TradeWind Services, LLC:

Attachments:

- CN-13, Revise Sub-grade Tolerance Specification
- CN-14, Change Coordinates for MH 34 and MH 35
- CN-15, Leachate Storage Tank 3, design revisions
- CN-16, Leachate storage tank, revision to drawings
- CN-17, Additions and Modifications to Leachate Transfer Line

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within _____ days
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM: _____
 William F. Melvin _____ *W.F. Melvin* _____ 6/9/10
 Print Name Signature Date

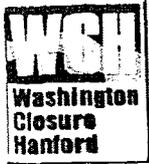
STR: _____
 Charles V. Skiba _____ *CV Skiba* _____
 Print Name Signature Date

Procurement: _____
 Dana D. Looney _____ *Dana D. Looney* _____ 6-10-10
 Print Name Signature Date

Initial: N/A N/A N/A N/A N/A
 Safety QA Eng. Env. RadCon

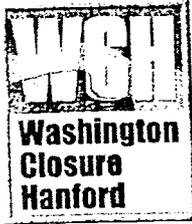
Acknowledge and accept this change notice as specified.
 Acknowledge and accept with the exception of the following:

<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted



SUBCONTRACT CHANGE NOTICE

Signature:	Company:	Date:
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149853

April 14, 2010

Mr. Kurt N. Massey, Project Manager
TradeWind Services, LLC
2620 Fermi Ave. MSIN: T2-12
Richland, WA 99354

Subject: Subcontract No. S012308A00
**CHANGE NOTICE CN-013, REVISE SUBGRADE TOLERANCE
SPECIFICATION (FUNDED BY THE AMERICAN RECOVERY AND
REINVESTMENT ACT OF 2009)**

Dear Mr. Massey:

Attached please find Change Notice CN-013, *Revise Subgrade Tolerance Specification*.

If you have any questions regarding this change notice, please contact me at (509)373-9151, or
(509)539-9701.

Sincerely,

B. Jack Howard
Subcontract Technical Representative

BJH:djt

Attachments: (1) Change Notice CN-013
(2) WCH Drawing No. 0600X-DD-C0458, Rev. 1

Document/CCN Number: 149853 Date: April 14, 2010

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J. R.	T2-10	
X	Howard, B.J.	T2-10	X
X	Klickovich, B.D.	T2-10	
	Looney, D.	H4-17	
	Melvin, W.F.	T2-10	
X	Palmersheim, S.M.	H4-17	X
X	Schilperoort, D.L.	T2-10	
	Skiba, C.V.	T2-10	
	Wintle, T.E.	T2-10	
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- 013

Revise Subgrade Tolerance spec. _____

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

CN- _____

Envirotech, S66X528A00

CN- _____

Comments:

CN-013



Distribution Completed: Yes: **X** No: Initials **DGT**

TO BE COMPLETED BY R&DC:

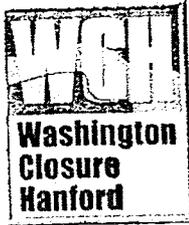
RECORD TYPE _____

DATA ENTRY BY _____

SCANNED/# PGS _____

REPRO BY _____

DOCS OPEN # _____



149854

April 14, 2010

Mr. Kurt N. Massey, Project Manager
TradeWind Services, LLC
2620 Fermi Ave. MSIN: T2-12
Richland, WA 99354

Subject: Subcontract No. S012308A00
**CHANGE NOTICE CN-014, CHANGE THE COORDINATES OF
MANHOLES MH-34 & MH-35 (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Massey:

Attached please find Change Notice CN-014, *Change the Coordinates of Manholes MH-034 and MH-035*.

If you have any questions regarding this change notice, please contact me at (509)373-9151, or (509)539-9701.

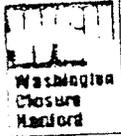
Sincerely,

A handwritten signature in black ink that reads 'B. Jack Howard'.

B. Jack Howard
Subcontract Technical Representative

BJH:djt

- Attachments: (1) Change Notice CN-014
(2) WCH Drawings: No. 0600X-DD-G0047, Rev. 1, 0600X-DD-C0466, Rev. 1
0600X-DD-C0467, Rev. 1
(3) DCN-0600-DD-G0047-00-01



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: TradeWind Services, LLC	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-12 Richland, WA 99354	Effective Date: 4/14/10
	Subcontract No.: S012308A00
	Change Notice No.: 014
	Page 1 of 2

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

Change the coordinates of manholes MH-34 and MH-35. Funded by the American Recovery and Reinvestment Act of 2009 (ARRA):

The following changes are required due to a change in the design locations of MH-34 and MH-35 to avoid conflicts with the existing underground utilities:

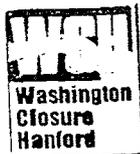
1. Revise the coordinates for MH-34 and MH-35 per DCN 0600X-DD-G0047-00-01
2. Revise the pipe slopes and lengths effected by the change in the design location of MH-34 and MH-35

Attachments:

1. Drawing #0600X-DD-G0047 Rev.1
2. Drawing #0600X-DD-C0466 Rev.1
3. Drawing #0600X-DD-C0467 Rev.1
4. DCN 0600X-DD-G0047-00-01

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within 10 days
<input checked="" type="checkbox"/> Drawings/Data attached	<input checked="" type="checkbox"/> DCNs are attached

Project Manager/CAM: William F. Melvin Print Name	<i>W.F. Melvin</i> Signature	4-14-10 Date
STR: B. Jack Howard Print Name	<i>B. Jack Howard</i> Signature	4/14/10 Date
Procurement: S.M. Palmersheim Print Name	<i>S.M. Palmersheim</i> Signature	4/14/10 Date
Initial:	<input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <i>TW</i> <input type="checkbox"/> N/A <i>BC</i> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A	Safety QA Eng. Env. RadCon



SUBCONTRACT CHANGE NOTICE

<input type="checkbox"/> Acknowledge and accept this change notice as specified.		
<input type="checkbox"/> Acknowledge and accept with the exception of the following:		
<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted
Signature:	Company:	Date:

NOTES

1. COORDINATES FOR THE TRENCH CELLS ARE SHOWN ON DRAWINGS 0600X-DD-00452, 00453, 00454, 00455.



U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE
HANFORD LLC
GENERAL CONTRACTOR

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 - 10
COORDINATE TABLE

WPI JOB NO. 14655
DOE CONTRACT NO. 60000047 DMC
TASK 0600X-DD-G0047

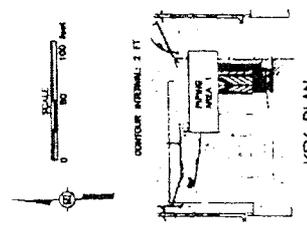
REVISIONS
NO. DATE BY
1 06/11/03 JLD
2 06/11/03 JLD
3 06/11/03 JLD
4 06/11/03 JLD
5 06/11/03 JLD
6 06/11/03 JLD
7 06/11/03 JLD
8 06/11/03 JLD
9 06/11/03 JLD
10 06/11/03 JLD

COORDINATES

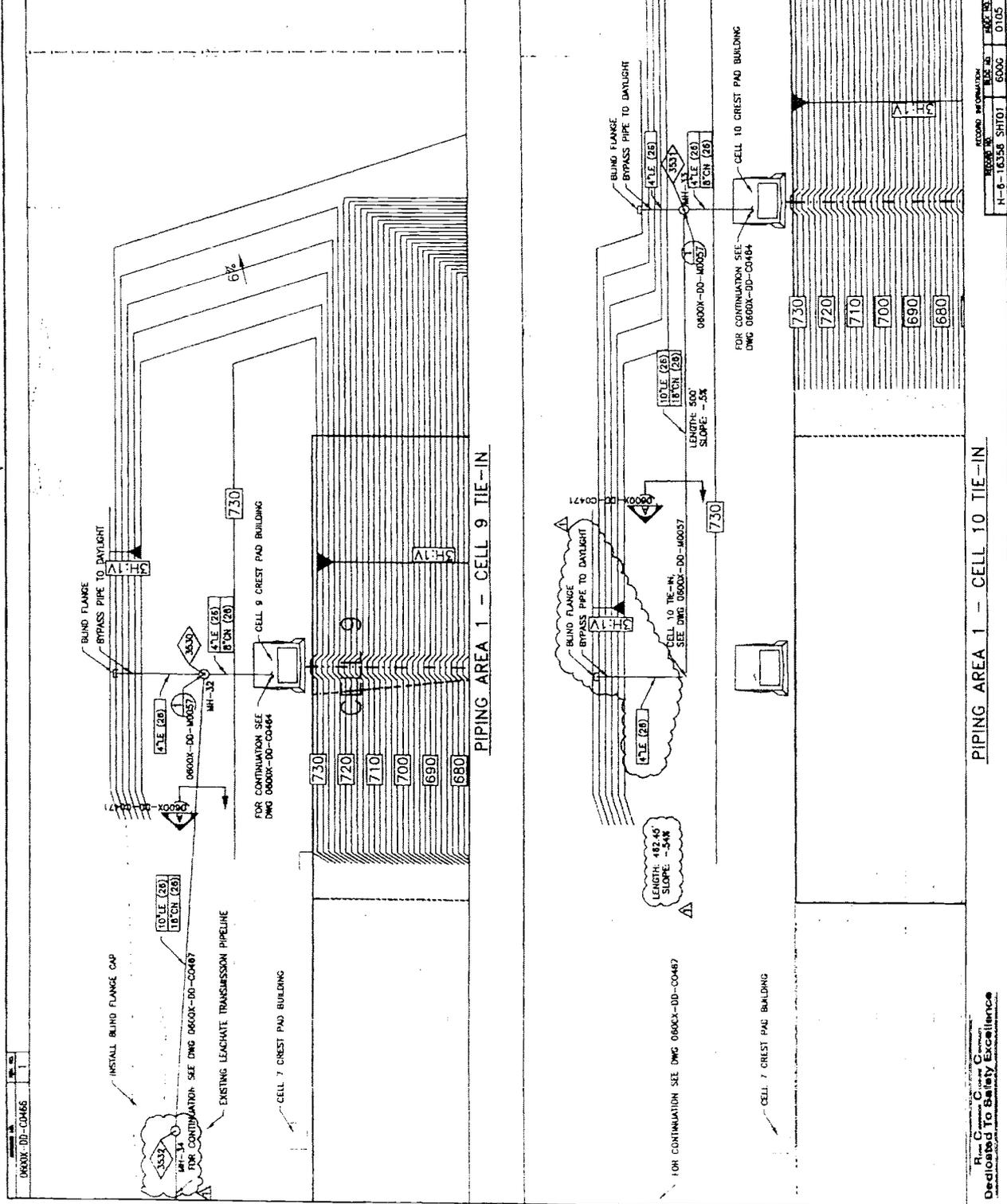
POINT NO.	DESCRIPTION	NORTH	EAST	ELEVATION	REMARKS	POINT NO.	DESCRIPTION	NORTH	EAST	ELEVATION	REMARKS
3301	EXISTING & GENERAL SITE FEATURES					3350	EXISTING FENCE CORNER	439887.66	1865493.10		
3302	SURVEY CONTROL POINT HSM-149	439000.276	1861560.750	669.20		3351	EXISTING FENCE CORNER	439887.66	1865493.10		
3303	SURVEY CONTROL POINT HSM-152	438947.860	1861419.4610	678.071		3352	EXISTING FENCE CORNER	439102.48	1865552.20		
3304	SURVEY CONTROL POINT HSM-156	44217.0788	1864480.3360	680.541		3353	EXISTING FENCE CORNER	439102.48	1865683.01		
3305	SURVEY CONTROL POINT HSM-143	438966.7238	1864376.9180	680.440		3354	PROPOSED CELL 9,10 FENCE CORNER	439182.66	1869750.00		
3306	SURVEY CONTROL POINT HSM-150	438034.9688	1864430.8870	653.77		3355	PROPOSED CELL 9,10 FENCE CORNER	439887.66	1869750.00		
3307	SURVEY CONTROL POINT HSM-144	438966.8118	1867428.3820	704.728							
3308	SURVEY CONTROL POINT HSM-136	442702.4718	1870811.8420	733.576							
3309	SURVEY CONTROL POINT HSM-145	438138.8718	1870811.8420	722.01							
3310	SURVEY CONTROL POINT HSM-146	438138.8718	1870811.8420	715.93		3301	TEE	441912.83	1867268.78		AS-BUILT
3311	SURVEY CONTROL POINT HSM-140	442510.2428	1870811.8420	745.93		3302	VALVE	441995.84	1867268.78		AS-BUILT
3312	SURVEY CONTROL POINT HSM-141	442495.5318	1870811.8420	744.81		3303	FIRE HYDRANT	441953.81	1867268.78		AS-BUILT
3313	SURVEY CONTROL POINT HSM-135	442495.5318	1861410.8270	692.42		3312	BLIND FLANGE (END OF PIPE)	441924.50	1867268.78		AS-BUILT
3314	BORING 609-35-60B	440475.58	1867882.43	701.40	ABANDONED BY OTHERS	3313	10" ELBOW	441924.50	1867268.78		AS-BUILT
3315	BORING 609-35-60B	439786.36	1868272.51	701.40		3314	10" ELBOW	441924.50	1867268.78		AS-BUILT
3316	WELL 609-35-70	439591.81	1865375.65	692.10		3315	END DOUBLE CONTAINMENT	441924.50	1867268.78		AS-BUILT
3317	WELL 609-35-66	439598.15	18684812.46	732.50		3316	END DOUBLE CONTAINMENT	440172.00	1867268.78		AS-BUILT
3318	WELL 609-35-70A	439664.01	18683006.24	702.74		3317	10" ELBOW	440172.00	1867268.78		AS-BUILT
3319	WELL 8-38-70	443958.06	1865160.84	714.25		3318	BLIND FLANGE (END OF PIPE)	440309.80	1867268.78		AS-BUILT
3320	WELL 609-38-60A	442668.78	1867268.78	718.17		3319	10" ELBOW	441924.50	1869026.36		CELL 9
3321	WELL 8-38-55	440971.53	1865011.50	758.92		3320	END DOUBLE CONTAINMENT	441857.00	1868018.00		CELL 9
3322	WELL 609-38-67	440971.53	1867711.00			3321	END DOUBLE CONTAINMENT	441857.00	1868578.97		CELL 10
3323	WELL 609-37-66	441881.78	1867085.87			3322	10" ELBOW	441857.00	1868578.97		CELL 10
3324	WELL 609-37-66	441881.78	1867085.87			3323	BLIND FLANGE (END OF PIPE)	441857.00	1869015.00		CELL 10
3325	WELL 609-37-66	441881.78	1867085.87			3324	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3327	WELL	441180.84	1868163.90			3325	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3328	WELL	442257.08	1869183.36			3326	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3329	MANHOLE #31 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3327	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3330	MANHOLE #32 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3328	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3331	MANHOLE #33 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3329	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3332	MANHOLE #34 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3330	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3333	MANHOLE #35 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3331	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3334	MANHOLE #36 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3332	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3335	MANHOLE #37 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3333	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3336	MANHOLE #38 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3334	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3337	MANHOLE #39 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3335	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3338	MANHOLE #41 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3336	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3339	MANHOLE #42 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3337	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3340	MANHOLE #43 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3338	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3341	MANHOLE #44 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3339	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3342	MANHOLE #45 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3340	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3343	MANHOLE #46 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3341	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3344	MANHOLE #47 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3342	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3345	MANHOLE #48 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3343	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3346	MANHOLE #49 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3344	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3347	MANHOLE #50 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3345	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3348	MANHOLE #51 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3346	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3349	MANHOLE #52 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3347	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3350	MANHOLE #53 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3348	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3351	MANHOLE #54 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3349	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3352	MANHOLE #55 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3350	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3353	MANHOLE #56 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3351	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3354	MANHOLE #57 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3352	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3355	MANHOLE #58 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3353	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3356	MANHOLE #59 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3354	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3357	MANHOLE #60 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3355	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3358	MANHOLE #61 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3356	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3359	MANHOLE #62 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3357	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3360	MANHOLE #63 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3358	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3361	MANHOLE #64 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3359	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3362	MANHOLE #65 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3360	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3363	MANHOLE #66 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3361	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3364	MANHOLE #67 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3362	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3365	MANHOLE #68 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3363	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3366	MANHOLE #69 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3364	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3367	MANHOLE #70 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3365	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3368	MANHOLE #71 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3366	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3369	MANHOLE #72 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3367	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3370	MANHOLE #73 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3368	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3371	MANHOLE #74 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3369	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3372	MANHOLE #75 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3370	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3373	MANHOLE #76 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3371	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3374	MANHOLE #77 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3372	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3375	MANHOLE #78 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3373	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3376	MANHOLE #79 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3374	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3377	MANHOLE #80 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3375	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3378	MANHOLE #81 CENTERLINE	441857.00	1867504.00	730.30	AS-BUILT	3376	LEACHATE STORAGE TANK CORNER	441857.00	1869015.00		CELL 10
3379	MANHOLE #82 CENTERLINE	441857.00									

NOTES

1. SURVEY DATUM: NAVD 83 HORIZONTAL; NAD 83 (91) VERTICAL
2. SEE DRAWING 0600X-DD-00053 FOR PIPING MATERIAL DESIGNATION.
3. BYPASS PIPE SHALL EXTEND 12" OUT FROM THE GROUND SURFACE.
4. SEE DRAWING 0600X-DD-00047 FOR COORDINATE INFORMATION.



U.S. DEPARTMENT OF ENERGY DOE RICHLAND OPERATIONS OFFICE RYER CORRIDOR CLOSURE CONTRACT	
WASHINGTON CLOSURE CONSULTANTS, LLC RICHLAND, WASHINGTON	WEAVER BOOS CONSULTANTS, LLC SEASIDE, CALIFORNIA
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY CELLS 9 - 10	
WORK ORDER NO. 14655	DOE CONTRACT NO. DE-AC06-05OR-14655
PROJECT NO. 0600X-DD-00046	ISSUANCE NO. 1
DATE: 07/24/07	BY: ERDF



RECORD INFORMATION	RECORD NO.	DATE	BY
N-6-10358 SH101	8000	07/24	ERDF

R. G. Weaver
 Weaver Boos
 Dedicated To Safety Excellence

<h2 style="margin: 0;">DESIGN CHANGE REQUEST/ DESIGN CHANGE NOTICE</h2> <p style="margin: 5px 0 0 40px;"><i>Washington Closure Hanford</i></p>		Job No. 14655	Page 1 of 1
FAC 600 ERDF		OU	TSD
DCM- 0600X-DD-G0047-00-01 <small>DESIGN DOCUMENT REV YES NO</small>			
PART I: Design Change Request			
Reason for Change: Move manholes MH-34 and MH-35 due to buried utilities.			
DOCUMENT CONTROL <i>No. 03/3/2010</i>			
Affected Documents & Revision Number: (List Drawings, Specifications, Scope of Work, etc.) Drawing No. 0600X-DD-G0047, Rev 0			
Existing Condition: On Drawing No. 0600X-DD-G0047, Rev. 0: Coordinate No. 3532 lists the Easting as 1867504.00, and Coordinate No. 3533 lists the Easting as 1867004.00			
NOTE: For all VSS affected documents, identify the configuration management designation (Essential, Support, Reference)			
Description of Change: On Drawing No. 0600X-DD-G0047, Rev. 0: Change the Easting of Coordinate No. 3532 from 1867504.00 to 1867534.00 and the Easting of Coordinate No. 3533 from 1867004.00 to 1867034.00			
S/C No.: S012308A00	W/O No: NR	Originator/Date:	
Buyer: S. Palmersheim	POC: N/A	N/A - P.E. is Originator	
Request Concurrence/Date: W.A. Borlaug <i>WA Borlaug 3/31/10</i>	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Rejected (provide justification)	DCM Design Eng/Date: T.E. Wintle <i>T. Wintle 3/31/10</i>	
PART II: Review and Approval			
Does DCN supersede a previous change (ECN, FCR/FCN, DCN, etc.)?		Yes	No
Doc No.		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Revision to hazard classification or safety analysis required?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Engineering Concurrence: Revision to the site specific health and safety plan required?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
ESH&Q Concurrence: DCN Incorporation required?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Material requisition, purchase memorandum, or other document prepared?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Does the requirement of NS-1-2.4 (MOC) or NS-1-2.5 (USQ) apply to this change?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Nuclear Safety Concurrence:		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Checker/Date: <i>03-31-10</i> <i>W.A. Borlaug</i>	System Eng./Date (if applicable): N/A	DCM Approval/Date: W.A. Borlaug <i>WA Borlaug 3/31/10</i>	
Remarks: Coordinate changes will be incorporated into Rev. 1 of controlled drawing set		Project Director/Date: (See Inst.) N/A - no additional funding required	

Document/CCN Number: 149854 Date: April 14, 2010

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J. R.	T2-10	
X	Howard, B.J.	T2-10	X
X	Klickovich, B.D.	T2-10	
	Looney, D.	H4-17	
	Melvin, W.F.	T2-10	
X	Palmersheim, S.M.	H4-17	X
X	Schilperoort, D.L.	T2-10	
	Skiba, C.V.	T2-10	
	Wintle, T.E.	T2-10	
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- 014

Change the coordinates of Manholes 34 & 35

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

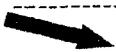
CN- _____

Envirotech, S66X528A00

CN- _____

Comments:

CN-014


 Distribution Completed: Yes: **X** No: Initials DG7

TO BE COMPLETED BY R&DC:

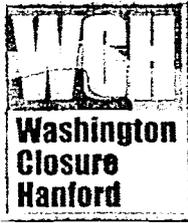
RECORD TYPE _____

DATA ENTRY BY _____

REPRO BY _____

SCANNED/# PGS _____

DOCS OPEN # _____



149855

April 14, 2010

Mr. Kurt N. Massey, Project Manager
TradeWind Services, LLC
2620 Fermi Ave. MSIN: T2-12
Richland, WA 99354

Subject: Subcontract No. S012308A00
**CHANGE NOTICE CN-015, LEACHATE STORAGE TANK 3 DESIGN
REVISIONS (FUNDED BY THE AMERICAN RECOVERY AND
REINVESTMENT ACT OF 2009)**

Dear Mr. Massey:

Attached please find Change Notice CN-015, *Leachate Storage Tank 3 Design Revisions*.

If you have any questions regarding this change notice, please contact me at (509)373-9151, or (509)539-9701.

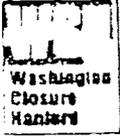
Sincerely,

A handwritten signature in black ink that reads 'B. Jack Howard'. The signature is written in a cursive style with a large initial 'B'.

B. Jack Howard
Subcontract Technical Representative

BJH:djt

Attachments: (1) Change Notice CN-015
(2) WCH Drawing: No. 0600X-DD-C0468, Rev. 1



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: TradeWind Services, LLC	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-12 Richland, WA 99354	Effective Date: 04/14/10
	Subcontract No.: S012308A00
Change Notice No.: 015	Page 1 of 2

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

Delete the Equalization Pipe between the New Leachate Tank and the Existing Leachate Tank [Funded by the American Recovery and Reinvestment Act of 2009 (ARRA)]:

1. Delete the equalization pipe between the new Leachate Tank and the Existing Leachate Tank as shown on attached Drawing No. 0600X-DD-C0468, Rev. 1.
2. Replace Exhibit F, Drawing No. 0600X-DD-C0468, Rev. 0 with the attached Drawing No. 0600X-DD-C0468, Rev. 1.

Attachments:

1. Drawing No. 0600X-DD-C0468, Rev. 1.

Proposal:

Submit a detailed proposal that shows the credit to eliminate the equalization pipe between the new Leachate Tank and the Existing Leachate Tank. The proposal shall provide labor hours and burdened hourly rates; equipment hours and rates; itemized material costs; and other necessary costs to complete the work.

<input type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input type="checkbox"/> Proposal not required	<input checked="" type="checkbox"/> Submit proposal within 10 days (CREDIT)
<input checked="" type="checkbox"/> Drawings/Data attached	

Project Manager/CAM:

William F. Melvin

Print Name

W.F.M. Melvin

Signature

4-17-10

Date

STR:

B. Jack Howard

Print Name

B. Jack Howard

Signature

4/14/10

Date

Procurement:

S. M. Palmersheim

Print Name

S. M. Palmersheim

Signature

4/14/10

Date

Initial:

N/A

N/A

TV

N/A

BU

N/A

N/A

Safety

QA

Eng.

Env.

RadCon



SUBCONTRACT CHANGE NOTICE

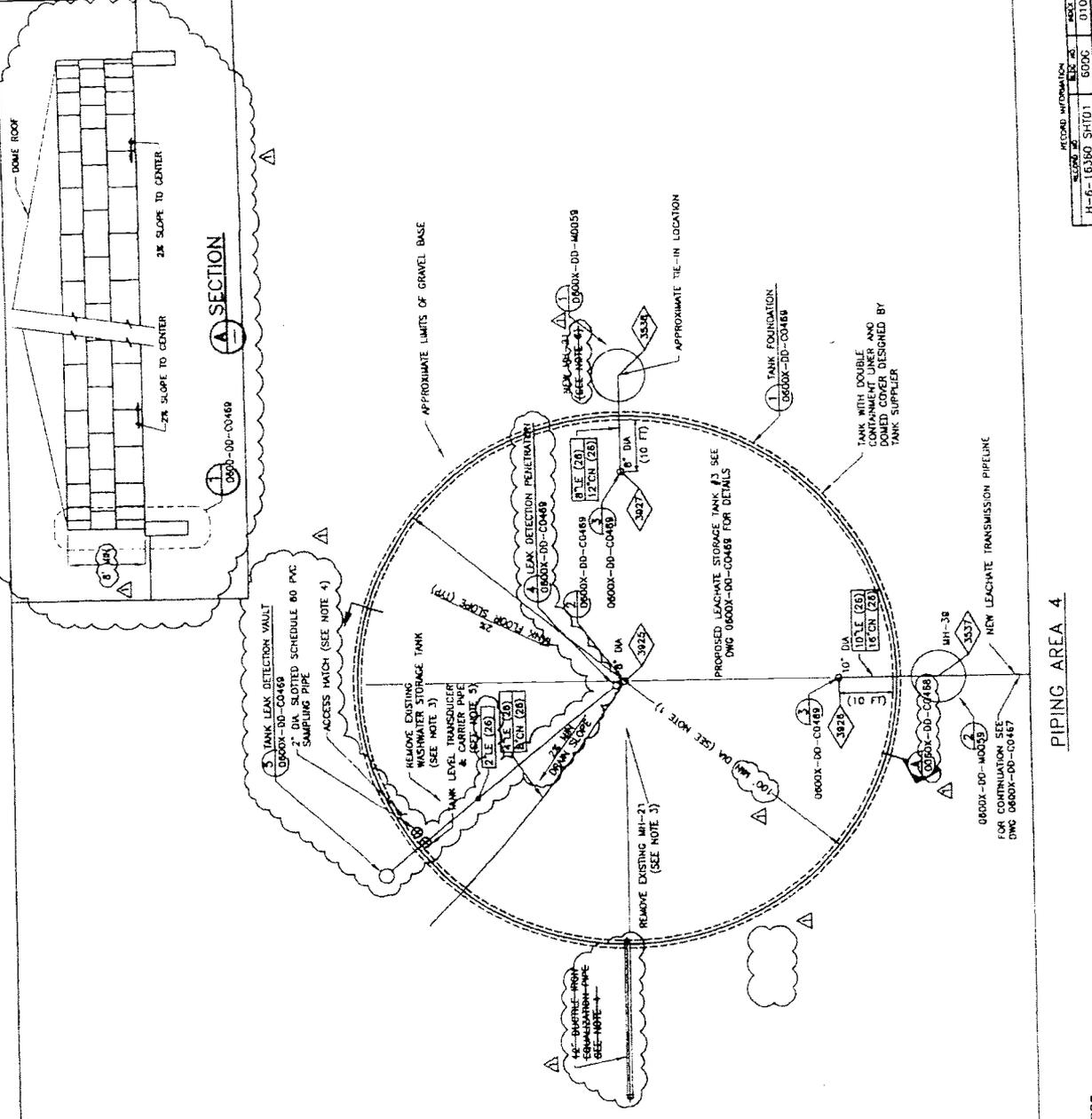
<input type="checkbox"/> Acknowledge and accept this change notice as specified.		
<input type="checkbox"/> Acknowledge and accept with the exception of the following:		
<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted
Signature:	Company:	Date:

NOTES

1. DIMENSIONS FOR THE TANK REFERS TO $\frac{1}{2}$ OF THE TANK SHELL CORRUPTIONS
2. DOME COVERS SHALL BE INSTALLED ON EXISTING LEACHATE STORAGE TANK #2. THE EXISTING LEACHATE TANKS SHALL BE REMOVED. THE TANKS SHALL BE CLEANED, AND THE TANK LINERS INSPECTED PRIOR TO INSTALLATION OF THE DOME COVERS.
3. THE EXISTING WASH WATER STORAGE TANK, FLOATING COVERS, EXISTING MANHOLE 21, PIPING, AND ASSOCIATED EQUIPMENT SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH THE WASTE MANAGEMENT PLAN.
4. (A) ACCESS MATCH TO PROVIDE ACCESS TO SAMPLING PIPE AND TRANSDUCER CARRIER PIPE
5. LOCALIZATION INCLUDING APPROXIMATE TANKS SHALL BE INSTALLED AT THE TANKS. THE LOCALIZATION PIPE SHALL BE 2" DIA. SLOTTED SCHEDULE 80 PVC PIPE. THE TANK LEVEL MEASUREMENT WATER TANK CONDUIT AND CONDUITS FOR THE LEACHATE PUMP STATION CARRIER PIPE SHALL BE 2" DIA. SLOTTED SCHEDULE 80 PVC PIPE.
6. CONNECT THE NEW LEACHATE TRANSDUCER NEW MH-21 TO THE EXISTING TRANSDUCER AND CONDUITS ROUTED TO THE LEACHATE PUMP STATION.



U.S. DEPARTMENT OF ENERGY DOE RICHLAND OPERATIONS OFFICE RIVER CORRIDOR CLOSURE CONTRACT		WASHINGTON CLOSURE HANFORD, LLC DOE RICHLAND OPERATIONS		NEAVER BOOS CONSULTANTS LLC DOE RICHLAND OPERATIONS	
ENVIRONMENTAL RESTORATION DISPOSAL FACILITY YARD PIPING PLAN - LEACHATE STORAGE TANK AREA		DOE CONTRACT NO.	6000468.DWG	DATE	01/05
REV. NO.	1	DATE	01/05	BY	ERDF
REV. NO.	1	DATE	01/05	BY	ERDF



PIPING AREA 4

RECORD INFORMATION	SCALE	DATE	01/05
H-6-16380 SH101	800C	0105	

Document/CCN Number: 149855 Date: April 14, 2010

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J. R.	T2-10	
X	Howard, B.J.	T2-10	X
X	Klickovich, B.D.	T2-10	
	Looney, D.	H4-17	
	Melvin, W.F.	T2-10	
X	Palmersheim, S.M.	H4-17	X
X	Schilperoort, D.L.	T2-10	
	Skiba, C.V.	T2-10	
	Wintle, T.E.	T2-10	
X	ERDF Project Files	T2-10	X
X	Document Control	H4-17	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- 015

Leachate Storage Tank 3 Design revs.

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

CN- _____

Envirotech, S66X528A00

CN- _____

Comments:

CN-015

➔ Distribution Completed: Yes: **X** No: Initials **DJ7**

TO BE COMPLETED BY R&DC:

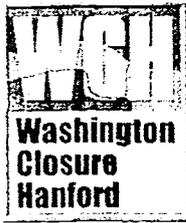
RECORD TYPE _____

DATA ENTRY BY _____

REPRO BY _____

SCANNED/# PGS _____

DOCS OPEN # _____



149856

April 14, 2010

Mr. Kurt N. Massey, Project Manager
TradeWind Services, LLC
2620 Fermi Ave. MSIN: T2-12
Richland, WA 99354

Subject: Subcontract No. S012308A00
**CHANGE NOTICE CN-016, LEACHATE STORAGE TANK LEAK
DETECTION SYSTEM REVISION (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Massey:

Attached please find Change Notice CN-016, *Leachate Storage Tank Leak Detection System Revision to Drawings*.

If you have any questions regarding this change notice, please contact me at (509)373-9151, or (509)539-9701.

Sincerely,

A handwritten signature in black ink that reads 'B. Jack Howard'. The signature is written in a cursive style with a large initial 'B'.

B. Jack Howard
Subcontract Technical Representative

BJH:djt

Attachments: (1) Change Notice CN-016
(2) WCH Drawing: No. 0600X-DD-G0047, Rev. 1, 0600X-DD-G0468, Rev. 1,
0600X-DD-C0469, Rev. 1



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: TradeWind Services, LLC	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-12 Richland, WA 99354	Effective Date: 04/14/10
	Subcontract No.: S012308A00
Change Notice No.: 016	Page 1 of 2

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

**Revise the Leak Detection System for the New Leachate Tank
[Funded by the American Recovery and Reinvestment Act of 2009 (ARRA)]:**

1. Furnish and install a leak detection vault/manhole and pipeline as shown on attached Drawing Nos. 0600X-DD-C468, Rev. 1 and 0600X-DD-C0469, Rev.1.
2. Revise the leachate tank penetrations as shown on attached Drawing Nos. 0600X-DD-C468, Rev. 1 and 0600X-DD-C0469, Rev.1.
3. Revise the leachate tank coordinates as shown on attached Drawing No. 0600X-DD-G0047, Rev. 1
4. Replace the Exhibit F, Rev. 0 Drawings with the attached Rev. 1 Drawings.

Attachments:

1. Drawing No. 0600X-DD-G0047, Rev.1
2. Drawing No. 0600X-DD-C0468, Rev.1
3. Drawing No. 0600X-DD-C0469, Rev.1

Proposal:

Submit a detailed proposal that shows the cost to complete the work specified in this change notice. The proposal shall provide labor hours and burdened hourly rates; equipment hours and rates; itemized material costs; and other necessary costs to complete the work.

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input type="checkbox"/> Proposal not required	<input checked="" type="checkbox"/> Submit proposal within 10 days
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM:

 William F. Melvin
 Print Name

 W.F.M.
 Signature

 4-14-10
 Date

STR:

 B. Jack Howard
 Print Name

 B. Jack Howard
 Signature

 4/14/10
 Date

Procurement:

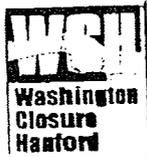
 S.M. Palmersheim
 Print Name

 S.M. Palmersheim
 Signature

 4/14/10
 Date

Initial: N/A N/A TFW N/A BU N/A N/A

Safety QA Eng. Env RadCon



SUBCONTRACT CHANGE NOTICE

<input type="checkbox"/> Acknowledge and accept this change notice as specified.		
<input type="checkbox"/> Acknowledge and accept with the exception of the following:		
<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted
Signature:	Company:	Date:

NOTES

COORDINATES FOR THE BENCH CELLS ARE SHOWN ON DRAWINGS 0600X-DD-0047, 0048, 0049, 0050, 0051, 0052, 0053, 0054, 0055



U.S. DEPARTMENT OF ENERGY
DOE RICHLAND OPERATIONS OFFICE
RIVER CORRIDOR CLOSURE CONTRACT

WASHINGTON CLOSURE CONSULTANTS LLC
INDIANAPOLIS, INDIANA

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY
CELLS 9 & 10
COORDINATE TABLE

WEAVER ROOS CONSULTANTS LLC
CORVALLIS, OREGON

DOE CONTRACT NO. 60000047 DMC
DATE 1/16/05

PROJECT NO. 0600X-DD-0047

SCALE: AS SHOWN

COORDINATES

POINT NO.	DESCRIPTION	NORTH	EAST	ELEVATION	REMARKS	POINT NO.	DESCRIPTION	NORTH	EAST	ELEVATION	REMARKS
3301	EXISTING & GENERAL SITE FEATURES					3950	EXISTING FENCE CORNER	439987.66	1665493.10		
3302	SURVEY CONTROL POINT HSM-10	436000.7378	1661560.7550	659.29		3951	EXISTING FENCE CORNER	439987.66	1665493.10		
3303	SURVEY CONTROL POINT HSM-11	436947.0566	1661420.3510	878.071		3952	EXISTING FENCE CORNER	439987.66	1665493.10		
3304	SURVEY CONTROL POINT HSM-12	442215.0766	1664490.3160	896.541		3953	EXISTING FENCE CORNER	439987.66	1665493.10		
3305	SURVEY CONTROL POINT HSM-13	439066.3736	1664378.9180	860.440		3954	PROPOSED CELL 9-10 FENCE CORNER	439987.66	1669750.00		
3306	SURVEY CONTROL POINT HSM-14	436034.8966	1664430.9920	855.77		3955	PROPOSED CELL 9-10 FENCE CORNER	439987.66	1669750.00		
3307	SURVEY CONTROL POINT HSM-15	438066.8116	1667428.5820	704.728							
3308	SURVEY CONTROL POINT HSM-16	442270.2478	1670411.8436	733.578							
3309	SURVEY CONTROL POINT HSM-17	439414.0476	1670414.8040	721.01							
3310	SURVEY CONTROL POINT HSM-18	442458.0188	1673311.5000	745.93		3901	TIK	441912.93	1672639.79		AS-BUILT
3311	SURVEY CONTROL POINT HSM-19	442570.2408	1676208.3170	739.27		3902	VALVE	441980.84	1673329.78		AS-BUILT
3312	SURVEY CONTROL POINT HSM-20	442459.5519	1679193.4860	744.91		3903	PURE HYDROANT	441983.81	1673494.63		AS-BUILT
3313	SURVEY CONTROL POINT HSM-21	442043.8388	1681410.8770	892.42							
3314	BORING 091-35-608	440475.56	1682787.31	713.80		3913	BLIND FLANGE (END OF PIPE)	441874.30	1682528.36		AS-BUILT
3315	BORING 091-35-609	439780.38	1682978.31	701.40		3914	10" ELBOW	441857.00	1682514.80		AS-BUILT
3316	WELL 091-35-70	439581.81	1683375.85	892.10		3915	END DOUBLE CONTAINMENT	441857.00	1682514.80		AS-BUILT
3317	WELL 091-35-80	439581.81	1683375.85	709.74		3916	10" ELBOW	440177.00	1682318.00		AS-BUILT
3318	WELL 091-35-70A	440568.15	1685048.84	709.74		3917	10" ELBOW	440177.00	1682318.00		AS-BUILT
3319	WELL 091-35-70B	440568.15	1685048.84	714.75		3918	BLIND FLANGE (END OF PIPE)	440099.80	168210.35		AS-BUILT
3320	WELL 091-38-60A	440568.15	1685280.45	718.17		3919	BLIND FLANGE (END OF PIPE)	441924.30	1686246.35		CELL 9
3321	WELL 091-38-60B	440568.15	1685280.45	758.82		3920	10" ELBOW	441924.30	1686246.35		CELL 9
3322	WELL 091-38-61	441027.15	1687715.00			3921	END DOUBLE CONTAINMENT	441857.00	1686218.00		CELL 9
3323	WELL 091-38-62	441027.15	1687715.00			3922	END DOUBLE CONTAINMENT	441857.00	1686218.00		CELL 10
3324	WELL 091-38-63	441897.76	1687895.87			3923	10" ELBOW	441857.00	1686218.00		CELL 10
3327	WELL	441109.98	1686913.30			3924	BLIND FLANGE (END OF PIPE)	441857.00	1686218.00		CELL 10
3328	WELL	442237.98	1690183.30			3925	BLIND FLANGE (END OF PIPE)	441857.00	1686218.00		CELL 10
3329	WELL	441109.98	1686913.30			3926	LEACHATE STORAGE TANK (INLET)	442187.00	1686218.00		CELL 10
3330	WELL	441109.98	1686913.30			3927	LEACHATE STORAGE TANK (INLET)	442187.00	1686218.00		CELL 10
3331	WELL	442237.98	1690183.30								
3332	WELL	441109.98	1686913.30								
3333	WELL	442237.98	1690183.30								
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3411	WELL	442237.98	1690183.30								
3412	WELL	441109.98									

- NOTES**
1. CONCRETE STRENGTH: MIN 4000 PSI COMPRESSIVE (CLASS 40) @ 28 DAYS.
 2. REINFORCING STEEL ASTM 615, GRADE 60
 3. TANK PENETRATIONS SHALL BE SHOP FABRICATED.

BY STAMP AND SEAL APPLY TO THIS DRAWING IN ALL WORKS UNDER MY DIRECTION AND CONTROL. THIS DRAWING HAS BEEN PREPARED IN COMPLIANCE WITH THE PROFESSIONAL ENGINEERING ACT AND I AM NOT RESPONSIBLE FOR THE DESIGN OR CONSTRUCTION OF THIS PROJECT UNLESS I HAVE BEEN SPECIFICALLY NOTIFIED AS A RESULT.

NO.	DATE	DESCRIPTION
1	1/1/14	ISSUED FOR PERMITS
2	1/1/14	ISSUED FOR BIDDING
3	1/1/14	ISSUED FOR CONSTRUCTION

U.S. DEPARTMENT OF ENERGY
 DOE RICHLAND OPERATIONS OFFICE
 RIVER CORRIDOR CLOSURE CONTRACT

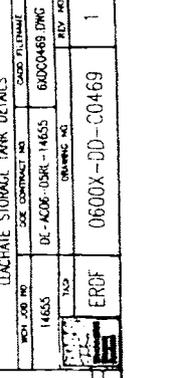
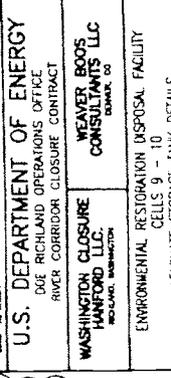
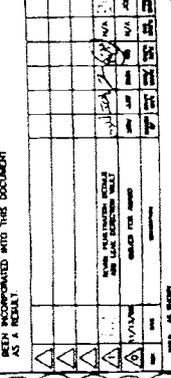
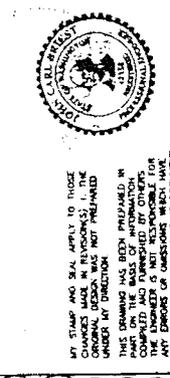
WASHINGTON CLOSURE CONSULTANTS LLC
 HANFORD, WASHINGTON

WEAVER BOOS CONSULTANTS LLC
 BOZEMAN, MT

ENVIRONMENTAL RESTORATION (NSP) FACILITY
 LEACHATE STORAGE TANK DETAILS

14655 DC-A206-DSK-14655 600048.DWG
 SHEET NO. 1 OF 1

0600X-DD-C0469



0600X-DD-C0469

1

TOP OF BRICK WALL ELEV. MATCH EXISTING TANKS

6\"/>

GEOTEXTILE ALONG WALL AND FLOOR

9\"/>

SECONDARY CONTAINMENT TANK GEOMEMBRANE ALONG WALL AND FLOOR

PRIMARY TANK GEOMEMBRANE ALONG WALL AND FLOOR

GEOTEXTILE (TYPE B)

1 1/2\"/>

FOUNDATION ANCHOR BOLT DESIGNED BY TANK MANUF.

6\"/>

12\"/>

EXTRUSION WELD SECONDARY GEOMEMBRANE TO FLAT STOCK

INSTALL 2 LAYERS OF GEOCOMPOSITE OVER FLATSTOCK

PRIMARY GEOMEMBRANE GEOCOMPOSITE

SECONDARY GEOMEMBRANE

GEOTEXTILE (TYPE B)

WELD PIPE TO HOPE FLATSTOCK

INSTALL FOUR GUSSETS BETWEEN PIPE AND HOPE FLATSTOCK

2\"/>

LOCKABLE HOPE SLIP-ON COVER

INSTALL FOUR GUSSETS

FLANGED 2\"/>

3\"/>

3\"/>

14-5-16316 SH101 8090C 0801

RECORD INFORMATION

0600X-DD-C0469

1

0600X-DD-C0448

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0600X-DD-C0469

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0600X-DD-C0448

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X	Klickovich, B.D.	T2-10	
	Looney, D.	H4-17	
	Melvin, W.F.	T2-10	
X	Palmersheim, S.M.	H4-17	X
X	Schilperoort, D.L.	T2-10	
	Skiba, C.V.	T2-10	
	Wintle, T.E.	T2-10	
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- 016

Leachate Storage Tank 3 Design revs.

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

CN- _____

Envirotech, S66X528A00

CN- _____

Comments:

CN-016



Distribution Completed: Yes: **X** No: Initials **DJ7**

TO BE COMPLETED BY R&DC:

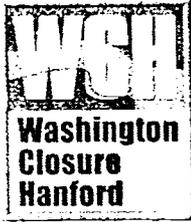
RECORD TYPE _____

DATA ENTRY BY _____

SCANNED/# PGS _____

REPRO BY _____

DOCS OPEN # _____



149859

April 15, 2010

Mr. Kurt N. Massey, Project Manager
TradeWind Services, LLC
2620 Fermi Ave. MSIN: T2-12
Richland, WA 99354

Subject: Subcontract No. S012308A00
**CHANGE NOTICE CN-017, ADDITIONS AND MODIFICATIONS TO
LEACHATE TRANSFER PIPING (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Massey:

Attached please find Change Notice CN-017, *Additions and Modifications to Leachate Transfer Piping*.

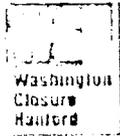
If you have any questions regarding this change notice, please contact me at (509)373-9151, or (509)539-9701.

Sincerely,

B. Jack Howard
Subcontract Technical Representative

BJH:djt

Attachments: (1) Change Notice CN-017
(2) WCH Drawings: No.s 0600X-DD-C0467, Rev. 1, 0600X-DD-M0058, Rev. 1, 0600X-DD-M0059, Rev. 1



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: TradeWind Services, LLC	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-12 Richland, WA 99354	Effective Date: 04/15/10
	Subcontract No.: S012308A00
	Change Notice No.: 017 Page 1 of 2

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

Install Dual Wall HDPE Pipeline Between Manhole Nos. MH-9 and MH-38 and Install Spools in New Manholes [Funded by the American Recovery and Reinvestment Act of 2009 (ARRA)]:

1. Furnish, install, and pressure test a dual wall HDPE pipeline between existing Manhole No. MH-9 and new Manhole No. MH-38 as shown on attached Drawing Nos. 0600X-DD-C467, Rev. 1 and 0600X-DD-M0058, Rev.1. Work also includes fabrication of a new elbow/tee for MH-9, concrete coring in MH-9 and MH-38 to install the dual wall pipeline, 10-inch gate valve in MH-38, fittings in MH-38.
2. Furnish and install flanged HDPE pipe spools in Manhole Nos. MH-34 through MH-38, and in MH-21 as shown on attached Drawing Nos. 0600X-DD-M0058, Rev. 1 and 0600X-DD-M0059, Rev. 1
3. Replace the Exhibit F, Rev. 0 Drawings with the attached Rev. 1 Drawings.

Attachments:

1. Drawing No. 0600X-DD-C0467, Rev. 1
2. Drawing No. 0600X-DD-M0058, Rev. 1
3. Drawing No. 0600X-DD-M0059, Rev. 1

Proposal:

Submit a detailed proposal that shows the cost to complete the work specified in this change notice. The proposal shall provide labor hours and burdened hourly rates; equipment hours and rates; itemized material costs; and other necessary costs to complete the work.

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input type="checkbox"/> Proposal not required	<input checked="" type="checkbox"/> Submit proposal within 10 days
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM:
 William F. Melvin *W.F. Melvin* 4-15-10
 Print Name Signature Date

STR:
 B Jack Howard *B Jack Howard* 4/15/10
 Print Name Signature Date

Procurement:
 S.M. Palmersheim *S.M. Palmersheim* 4-15-10
 Print Name Signature Date

Initial: N/A N/A *T&W* N/A *M&P* N/A N/A
 Safety QA Eng Env RadCon



SUBCONTRACT CHANGE NOTICE

<input type="checkbox"/> Acknowledge and accept this change notice as specified.		
<input type="checkbox"/> Acknowledge and accept with the exception of the following:		
<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted
Signature:	Company:	Date:

Document/CCN Number: 149859 Date: April 15, 2010

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	Looney, D.	H4-17	
	Melvin, W.F.	T2-10	
X	Palmersheim, S.M.	H4-17	X
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	
X	Wintle, T.E.	T2-10	X
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00	CN- <u>017</u>	<u>Additions/modifications to leachate piping</u>
DelHur, S010544A00	CN- _____	_____
W.Boos, 0600X-SC-G0524	CN- _____	_____
Envirotech, S66X528A00	CN- _____	_____

Comments:

CN-017



Distribution Completed: Yes: **X** No: Initials DJ7

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X	Howard, B.J.	T2-10	X
X	Klickovich, B.D.	T2-10	
X	Looney, D.	H4-17	X
	Melvin, W.F.	T2-10	
	Palmersheim, S.M.	H4-17	
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	X
X	Wintle, T.E.	T2-10	X
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

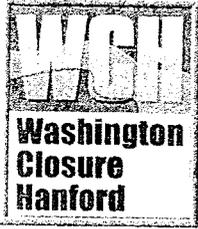
<u>Subcontract/No.</u>	<u>Change Notice</u>	<u>Description</u>
TradeWind, S012308A00	CN- _____	_____
DelHur, S010544A00	CN- _____	_____
W.Boos, 0600X-SC-G0524	CN- _____	_____
Envirotech, S013213A00	CN- 006	Construction Subcontract Spec. Revisions

Comments:


 Distribution Completed: Yes: **X** No: Initials DJ7

TO BE COMPLETED BY R&DC:

RECORD TYPE _____
 DATA ENTRY BY _____ SCANNED/# PGS _____
 REPRO BY _____ DOCS OPEN # _____



149873

April 28, 2010

Envirotech Engineers and Consultants
Mr. Joseph Voss, Project Manager
2620 Fermi Ave., MSIN T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-005, CONSTRUCTION SUBCONTRACT
SPECIFICATION REVISIONS (FUNDED BY THE AMERICAN
RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Attached please find Change Notice CN-005, *Construction Subcontract Specification Revisions* (as listed).

If you have any questions regarding this change notice, please contact me at (509)373-9476, or (509)942-9275.

Sincerely,

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

- Attachments:
- (1) Change Notice CN-005
 - (2) Specification No. 0600X-SP-C0077, Rev. 1, Geosynthetics
 - (3) Specification No. 0600X-SP-C0078, Rev. 1, Leachate Collection Systems and Lysimeters
 - (4) Specification No. 0600X-SP-C0082, Rev. 1, Lined Bolted Steel Liquid Storage Tanks
 - (5) Specification No. 0600X-SP-M0032, Rev. 1, Pipe, Valves and Specials



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: Envirotech Engineers and Consultants, Inc.	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-11 Richland, WA 99354 Mr. Joe Voss, Project Manager	Effective Date: 04/28/10
	Subcontract No.: S013213A00
	Change Notice No.: 005 Page 1 of 1

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:
Revisions to the Construction Subcontract Specifications
[Funded by the American Recovery and Reinvestment Act of 2009 (ARRA)]:

1. Replace your Construction Specifications Revision 0 with Revision 1 (Attached).

Attachments:

- (1) Specification No. 0600X-SP-C0077, Rev. 1, Geosynthetics
- (2) Specification No. 0600X-SP-C0078, Rev. 1, Leachate Collection Systems and Lysimeters
- (3) Specification No. 0600X-SP-C0082, Rev. 1, Lined Bolted Steel Liquid Storage Tanks
- (4) Specification No. 0600X-SP-M0032, Rev. 1, Pipe, Valves and Specials

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within ____ days
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM: William F. Melvin 4-28-10
 Print Name Signature Date

STR: Charles V. Skiba 4-28-10
 Print Name Signature Date

Procurement: Dana D. Looney 4-29-10
 Print Name Signature Date

Initial: N/A MAW N/A TEW N/A N/A N/A
 Safety QA Eng. Env. RadCon

Acknowledge and accept this change notice as specified.

Acknowledge and accept with the exception of the following:

ARE proceeding with this change notice A proposal: Has been submitted

ARE NOT proceeding with this change notice Will be submitted within ____ days

Will not be submitted

Signature: _____ Company: _____ Date: _____

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SPECIFICATION
FOR

APR 17 2010

WCH - DOCUMENT
CONTROL

CELL CONSTRUCTION - GEOSYNTHETICS

ENVIRONMENTAL RESTORATION DISPOSAL FACILITY (ERDF)

CELLS 9 & 10 CONSTRUCTION

WASHINGTON CLOSURE HANFORD		JOB NO. 14655	
SUPPLIER/SUBCONTRACTOR DOCUMENT STATUS STAMP			
1 <input checked="" type="checkbox"/> Work may proceed. 2 <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission. 3 <input type="checkbox"/> Revise and resubmit. Work may proceed prior to resubmission subject to resolution of indicated comments. 4 <input type="checkbox"/> Revise and resubmit. Work may not proceed. 5 <input type="checkbox"/> Permission to proceed not required.			
Permission to proceed does not constitute acceptance or approval of design details, calculations, analyses, test methods, or materials developed or selected by the supplier/subcontractor and does not relieve supplier/subcontractor from full compliance with contractual obligations or release any "holds" placed on the contract.			
	CIVIL MECHANICAL ELECTRICAL MECHANICAL PROCESS MATERIAL CASE PROJECT REP ENVIRONMENTAL HEALTH SAFETY OCCUPATIONAL PHYSICS FIRE PROTECTION CS INSULATION FIELD ENGINEER OTHER		
CHECK REVIEW REQUIREMENT	<input checked="" type="checkbox"/>		
REVIEWED BY	<i>W.A. Balog</i>		
<i>W.A. Balog</i> Project Engineer		4-26-10 Date	
DOCUMENT ID NUMBER 506524A00C N03-05-011-004A			
SCP.O. No.	SSRS ITEM	SUBMITTAL	



DOCUMENT CONTROL *dc 04/27/2010*

Rev.	Date	Reason for Revision	Originator	Checker	Project Engineer	LEAD Design Eng.
1	04/12/10	Geocomposite Transmissivity Geomembrane Seams	<i>JCH</i>	<i>Z</i>	<i>NCN</i>	<i>JCB</i>
0	11/13/09	Issued for Award	BLN	NCN	MS	JCB
Washington Closure Hanford, LLC		RIVER CORRIDOR CLOSURE CONTRACT		Job No. 14655 Specification No. 0600X-SP-C0077 Page 1 of 45		

CELL CONSTRUCTION - GEOSYNTHETICS

CONTENTS

1.0	GENERAL.....	5
1.1	SUMMARY.....	5
1.2	ABBREVIATIONS	5
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS	5
1.4	TECHNICAL SUBMITTALS.....	8
	1.4.1 Manufacturer's Data.....	8
	1.4.2 Installation Plan	8
	1.4.3 Quality Control Certification.....	8
1.5	DESCRIPTION	9
	1.5.1 Geomembrane.....	9
	1.5.2 Geotextiles	9
	1.5.3 Geocomposites.....	9
	1.5.4 Interface Friction Testing Requirements	9
2.0	MATERIALS AND EQUIPMENT.....	10
2.1	GEOMEMBRANE.....	10
	2.1.1 Types of Geomembrane.....	10
	2.1.2 Geomembrane Manufacturer.....	10
	2.1.3 Geomembrane Properties.....	11
	2.1.4 Geomembrane Manufacturing Quality Control.....	11
	2.1.5 Certification.....	12
	2.1.6 Manufacturing Plant Visit.....	12
	2.1.7 Conformance Testing.....	13
	2.1.8 Fabrication Quality Control	13
	2.1.9 Transportation, Handling, and Storage.....	13
2.2	GEOTEXTILES	14
	2.2.1 Types of Geotextiles	14
	2.2.2 Manufacturer.....	14
	2.2.3 Geotextile Properties	14
	2.2.4 Geotextile Conformance Testing.....	14
	2.2.5 Geotextile, Handling, and Storage.....	15
2.3	GEOCOMPOSITES	15
	2.3.1 Composition.....	15
	2.3.2 Manufacturer.....	15
	2.3.3 Geocomposite Properties	16
	2.3.4 Integrity.....	16
	2.3.5 Geocomposite Conformance Testing	16
	2.3.6 Geocomposite, Handling, and Storage	16
2.4	GEOSYNTHETIC PENETRATIONS	17
3.0	EXECUTION	17
3.1	GENERAL.....	17

3.1.1	Unacceptable Materials and Work.....	17
3.1.2	Personnel Qualifications.....	17
3.1.3	Applicability.....	17
3.1.4	Installation Plan.....	18
3.2	ANCHOR TRENCH EXCAVATION AND BACKFILLING.....	18
3.3	GEOMEMBRANE PLACEMENT - HDPE GEOMEMBRANE.....	18
3.3.1	Field Panel Identification.....	18
3.3.2	Field Panel Placement.....	18
3.3.3	Placement Conditions.....	19
3.3.4	Damage.....	19
3.4	FIELD SEAMING.....	20
3.4.1	Seaming Equipment and Products.....	20
3.4.2	Seam Layout.....	21
3.4.3	Weather Conditions for Seaming.....	22
3.4.4	Seam Preparation.....	23
3.4.5	General Seaming Procedures.....	23
3.5	GEOMEMBRANE SEAM TESTING.....	24
3.5.1	Trial Seams.....	24
3.5.2	Nondestructive Seam Continuity Testing.....	25
3.5.3	Destructive Seam Strength Testing.....	27
3.6	REPAIRS.....	29
3.6.1	General.....	29
3.6.2	Repair Procedures.....	29
3.6.3	Verification of Repairs.....	30
3.7	MATERIALS IN CONTACT WITH GEOMEMBRANE.....	30
3.7.1	Temperature.....	31
3.7.2	Minimum Thickness.....	31
3.7.3	Spreading Equipment.....	31
3.7.4	Spreading Operations.....	31
3.8	LINING SYSTEM ACCEPTANCE.....	31
3.9	GEOTEXTILES.....	32
3.9.1	Installation Plan.....	32
3.9.2	Geotextile Handling and Placement.....	32
3.9.3	Seaming.....	33
3.9.4	Geotextile Repair.....	33
3.9.5	Materials in Contact with Geotextiles.....	34
3.10	GEOCOMPOSITES.....	34
3.10.1	Installation Plan.....	34
3.10.2	Handling and Placement.....	34
3.10.3	Joining.....	35
3.10.4	Repair.....	36
3.10.5	Materials in Contact with Geocomposites.....	36
3.11	GEOSYNTHETIC PENETRATIONS.....	37
3.12	QUALITY ASSURANCE/QUALITY CONTROL.....	37

TABLES

TABLE 1 HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE –
60 MIL TEXTURED38

TABLE 2 HIGH DENSITY POLYETHYLENE (HDPE) GEOMEMBRANE -
100 MIL SMOOTH40

TABLE 3 REQUIRED SEAM PROPERTIES42

TABLE 4 REQUIRED GEOTEXTILE PROPERTIES43

TABLE 5 REQUIRED GEONET PROPERTIES44

TABLE 6 REQUIRED GEOCOMPOSITE PROPERTIES45

CELL CONSTRUCTION - GEOSYNTHETICS

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for the Geosynthetics liner systems for the Environmental Restoration Disposal Facility (ERDF).

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
CQA	Construction Quality Assurance
CQC	Construction Quality Control
EPA	Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
HDPE	High Density Polyethylene
QAP	Quality Assurance Plan
SSRS	Subcontractor/Supplier Submittal Requirements Summary

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Cell Construction. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Cell Construction. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1004	Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
ASTM D1204	Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

ASTM D1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2,700 kNm/m ³))
ASTM D1603	Standard Test Method for Carbon Black Content in Olefin Plastics
ASTM D1777	Standard Test Method for Thickness of Textile Materials
ASTM D3786	Standard Test Method for Bursting Strength of Textile Fabrics - Diaphragm Bursting Strength Tester Method
ASTM D3895	Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D4218	Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
ASTM D4355	Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D4716	Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
ASTM D4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4833	Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
ASTM D5199	Standard Test Method for Measuring the Nominal Thickness of Geosynthetics

ASTM D5261	Standard Test Method for Measuring Mass per Unit Area of Geotextiles
ASTM D5321	Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
ASTM D5397	Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D5641	Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
ASTM D5721	Standard Practice for Air-Oven Aging of Polyolefin Geomembranes
ASTM D5820	Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
ASTM D5885	Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Seaming Calorimetry
ASTM D5994	Standard Test Method for Measuring Core Thickness of Textured Geomembrane
ASTM D6392	Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Method
ASTM D6497	Standard Guide for Mechanical Attachment of Geomembrane to Penetrations or Structures
ASTM D6693	Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
ASTM D7005	Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
ASTM D7466	Standard Test Method for Measuring the asperity Height of Textured Geomembrane
EPA/600/R-93/182	EPA, Technical Guidance Document, Quality Assurance and Quality Control for Waste Containment Facilities*

GRIGM-11	UV Resistance (Accelerated Weathering of Geomembranes Using Fluorescent UVA Condensation Exposure Device)
GRIGM-12	Asperity Height (Asperity Measurement of Textured Geomembranes Using a Depth Gauge)
GRIGM-19	Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes
WAC 173 216	State Waste Discharge Permit Program
WAC 173 400	General Regulations for Air Pollution Sources

* Note that an update to EPA/600/R-93/182 has been published: Daniel, D.E. and Koerner, R. M. (2007). *Waste Containment Facilities: Guidance for Construction Quality Assurance and Construction Quality Control of Liner and Cover Systems*, second ed., ASCE, New York, NY, 351 pp.

1.4 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.4.1 Manufacturer's Data

Manufacturer's descriptive data, specification sheets, literature, and other data as necessary to fully demonstrate that those materials proposed for use comply with the requirements of these specifications. Certification that manufacturer has manufactured HDPE for at least 5 years and has manufactured a minimum of 10 million square feet.

1.4.2 Installation Plan

The SUBCONTRACTOR shall submit an installation plan describing the proposed methods for deployment, panel layout, seaming, including methods for connecting the new geosynthetics to the previously installed geosynthetics, repair, and protection. The plan shall include a quality control program for the SUBCONTRACTOR's activities related to geomembrane installation.

1.4.3 Quality Control Certification

Certifications for material composition and properties, Construction Quality Control (CQC) tests, admix surface, seam quality, equipment calibration, and other work activities as described in these specifications.

1.5 DESCRIPTION

Furnishing and installing the Geomembrane, Geotextile, and Geocomposite materials.

1.5.1 Geomembrane

The work includes manufacture, fabrication (if needed), supply, and installation of geomembrane as shown on the Drawings. Geomembrane is also referred to as High Density Polyethylene (HDPE) liner or flexible membrane liner (FML).

1.5.2 Geotextiles

The work includes manufacture, fabrication (if needed), supply, and installation of geotextiles as shown on the Drawings. This section also applies to geotextiles used to fabricate geocomposite drainage layers.

1.5.3 Geocomposites

The work includes manufacture, fabrication (if needed), supply, and installation of geocomposite drainage layers. The geocomposite will consist of a layer of geotextile 100% thermally bonded to each side of a geonet.

1.5.4 Interface Friction Testing Requirements

The materials used for construction shall meet the interface strength requirements of the design. To document that this requirement has been met, the SUBCONTRACTOR shall conduct the following test program prior to ordering materials.

Two sets of Interface Friction Testing in accordance with ASTM D5321 shall be conducted on the following interfaces:

- a. 60 mil textured geomembrane and the soil/bentonite admix
- b. 60 mil textured geomembrane and geocomposite
- c. Geocomposite and operations layer material

Testing shall be conducted under saturated conditions at nominal normal loads of 200, 400, and 600 psf to determine the peak angle and residual angle measured at a displacement of 2 inches. If the geomembrane texturing is variable, additional of tests will be required for interfaces with the geomembrane.

The residual friction angle of the interface friction testing shall meet the following minimum values with a normal load of 400 psf at a displacement of 2 inches and a cohesion of 0.

- | | | |
|----|---|-------|
| a. | 60 mil geomembrane/soil-bentonite admix | 24.0° |
| b. | 60 mil geomembrane/geocomposite | 24.0° |
| c. | geocomposite/operations layer material | 24.0° |

The average asperity height of the textured geomembrane utilized in the interface friction testing program will set the standard for all textured materials manufactured and delivered for installation. Materials not meeting this requirement will be rejected from use unless another friction angle test program is conducted with adjacent materials to document conformance with the design requirements.

SUBCONTRACTOR shall submit the results of the interface friction testing prior to shipment of the material. The CONTRACTOR will review this data for conformance with project strength requirements. At the direction of the CONTRACTOR, a registered professional engineer licensed in the State of Washington will prepare a stability analysis using the submitted data. The analysis will evaluate the proposed material's strength to determine if the required factors of safety of 1.0 and 1.3 under seismic and static are met. Allow CONTRACTOR 30 calendar days after receipt of the testing results for this evaluation.

Other combinations of shear strength parameters which can be shown by standard analytical techniques to provide static and dynamic factors of safety against slope failure that are equivalent or greater than those specified may be acceptable if approved by the CONTRACTOR.

2.0 MATERIALS AND EQUIPMENT

2.1 GEOMEMBRANE

2.1.1 Types of Geomembrane

- a. Geomembrane for the primary and secondary liner systems shall be un-reinforced HDPE, 60 mil thick, textured both sides, with smooth (non-textured) or lightly textured (i.e. GSE Weld Edge) surfaces on both sides along the longitudinal edges of each panel.
- b. Geomembrane for miscellaneous applications including the crest pad, rub sheets in sumps, and other applications as shown on the Drawings shall be un-reinforced HDPE, 100 mil thick, smooth.
- c. Geomembrane shall be produced with a white surface.

2.1.2 Geomembrane Manufacturer

The HDPE Geomembrane Manufacturer shall have a minimum of five years of experience as a commercial manufacturer of HDPE geomembranes for landfill applications. Manufacturer shall have manufactured HDPE for at least 5 years and manufactured a minimum of 10 million square feet.

2.1.3 Geomembrane Properties

2.1.3.1 Use of Recycled Polymer. The raw material shall be new polyethylene resin containing no more than 2% clean recycled polymer by weight. Two percent recycled polymer shall not include any finished sheet material that has actually seen some type of service performance. Regrind, reworked or trim materials in the form of chips or edge strips that have not actually seen some type of use may be added, if the material is from the same manufacturer and is the same formulation as the geomembrane being produced.

2.1.3.2 Resin Properties. The raw resin, (without carbon black) shall meet the following specifications:

- a. Specific Gravity (ASTM D1505/D792): > 0.930.

2.1.3.3 Finished Sheet Properties. The physical, mechanical, and environmental properties of the finished sheet shall meet or exceed the values specified in the tables for Required Geomembrane Properties at the end of this Technical Specification section. Where applicable, values in the table are Minimum Average Values.

2.1.4 Geomembrane Manufacturing Quality Control

2.1.4.1 Quality Control Testing. Quality control testing shall be carried out by the Manufacturer to demonstrate that the geomembrane meets the specifications specified above and in Geomembrane Tables. The CQA Subcontractor may carry out additional testing for purposes of determining conformance. If the results of the Manufacturer's and the CQA Subcontractor's testing differ significantly (i.e. greater than 10%), the testing shall be repeated by the CQA Subcontractor, and the Manufacturer shall be allowed to monitor this testing. The results of this latter series of tests will prevail, provided that the applicable test methods have been followed.

2.1.4.2 Required Information. Prior to the delivery of any geomembrane material, the Manufacturer shall submit the following information:

- a. The origin (Resin Supplier's name, resin production plant), identification (brand name, number) and production date of the resin.
- b. A list of quantities and descriptions of materials other than the base polymer which comprise the geomembrane.
- c. Copies of the quality control certificates issued by the Resin Supplier.

- d. Reports on the tests conducted by the Manufacturer to confirm that the quality of the resin used to manufacture the geomembrane satisfy these Specifications.
- e. A statement that recycled polymer (if any) is clean and does not exceed 2% by weight.
- f. A properties sheet including, at a minimum, specified properties, measured using test methods indicated in these specifications, or equivalent.
- g. Test reports, including sampling procedures, conducted by the Manufacturer to confirm that the geomembrane meets the specifications. Tests shall be conducted on each production lot of geomembrane or every 53,820 square feet, whichever results in the greater number of tests.
- h. A certification that property values given in the properties sheet are guaranteed by the Geomembrane Manufacturer.

2.1.5 Certification

Prior to shipment, the Geomembrane Manufacturer shall provide a quality control certificate for each roll of geomembrane. The quality control certificate shall be signed by a responsible party employed by the Geomembrane Manufacturer, such as the production manager. The quality control certificate shall include:

- a. Roll numbers and identification, resin lot, and batch numbers.
- b. Sampling procedures and results of quality control tests.
- c. Information package containing the information required by Section 2.2.5.

2.1.6 Manufacturing Plant Visit

The Manufacturer shall allow the CONTRACTOR or his designated representative to visit the manufacturing plant, if the CONTRACTOR so chooses. If possible, the visit shall be prior to or during the manufacturing of the geomembrane rolls for the specific project. The CONTRACTOR or his designated representative shall review the manufacturing process, quality control, laboratory facilities, and testing procedures.

During the visit, visiting personnel will also:

- a. Confirm that the measurements of properties by the Manufacturer are properly documented and test methods used are acceptable.
- b. Spot inspect the rolls and confirm that they are free of holes, blisters, or any sign of contamination by foreign matter.

- c. Review packaging and transportation procedures to confirm that these procedures are not damaging the geomembrane.
- d. Confirm that roll packages have a label indicating the name of the manufacturer, type of geomembrane, thickness, and roll number.
- e. If applicable, confirm that extrusion rods and/or beads are derived from the same base resin as the geomembrane.

The Geomembrane Manufacturer shall accommodate these activities.

2.1.7 Conformance Testing

Prior to shipment, the CQA Subcontractor shall obtain samples and perform testing in accordance with the Construction Quality Assurance Plan. The CQA Subcontractor will test the samples to determine conformance to both the design specifications and the list of guaranteed properties.

2.1.8 Fabrication Quality Control

Factory panel fabrication, if any, shall be in accordance with the applicable sections of these Technical Specifications for field panel placement and seaming.

2.1.9 Transportation, Handling, and Storage

Transportation of the geomembrane shall be the responsibility of the SUBCONTRACTOR. Handling on site shall be the responsibility of the SUBCONTRACTOR.

Upon delivery at the site, the SUBCONTRACTOR and the CQA Subcontractor shall observe the surfaces of rolls or factory panels for defects and for damage. This inspection shall be conducted without unrolling rolls or unfolding factory panels unless defects or damages are found or suspected. The CQA Subcontractor will determine:

- a. Rolls, factory panels, or portions thereof, which shall be rejected and removed from the site because they do not meet requirements.
- b. Rolls or factory panels which include repairable flaws.
- c. Rolls or factory panels that are not properly labeled. No unlabelled rolls shall be used for any application. Unlabelled rolls shall be removed from the site and replaced at the SUBCONTRACTOR's expense.

The SUBCONTRACTOR shall be responsible for storage and protection of the geomembrane. Geomembrane rolls shall be stored on a prepared subgrade free of rocks and graded to drain away from stored materials.

2.2 GEOTEXTILES

2.2.1 Types of Geotextiles

- a. Type A geotextile shall be 8 oz/yd² nominal weight and shall be used for separation of operations and drainage layers in the landfill, in the geocomposite drainage layer, and at other locations as shown on the Drawings.
- b. Type B geotextile shall be 16 oz/yd² nominal weight and shall be used for cushioning of geomembranes on the landfill floor and at other locations as shown on the Drawings.

Geotextiles, regardless of type, shall be nonwoven, needle punched polypropylene.

2.2.2 Manufacturer

The Geotextile Manufacturer shall have a minimum of five years of experience as a commercial manufacturer of geotextiles for landfill applications.

2.2.3 Geotextile Properties

2.2.3.1 Property Values. Geotextile properties shall meet or exceed the values specified in the table titled "Required Geotextile Properties".

The Manufacturer shall provide test results for properties listed in the Referenced Table

The Manufacturer shall certify that the materials supplied meet the requirements of this Subcontract.

2.2.3.2 Integrity. Geotextiles shall retain their structure during handling, placement, and long-term service.

2.2.4 Geotextile Conformance Testing

Prior to shipment, the CQA Subcontractor shall obtain samples and perform testing in accordance with the Construction Quality Assurance Plan. The CQA Subcontractor will test the samples to determine conformance to both the design specifications and the list of guaranteed properties.

2.2.5 Geotextile, Handling, and Storage

Geotextiles shall be supplied in rolls wrapped in protective dust-proof covers and marked or tagged with the following information:

- a. Manufacturer's name.
- b. Product identification.
- c. Lot number.
- d. Roll number.
- e. Roll dimensions.

Transportation of the geotextiles to the site and handling on site shall be the responsibility of the SUBCONTRACTOR.

During shipment and storage, the geotextile shall be protected from mud, dirt, dust, puncture, cutting, moisture, or other damaging or deleterious conditions. Geotextile shall be stored on a prepared subgrade free of rocks graded to drain away from stored materials.

The SUBCONTRACTOR shall be responsible for the storage and protection of the geotextiles. Geotextile stockpile shall be covered with a tarp to protect from all sunlight, dust, and precipitation.

2.3 GEOCOMPOSITES

The work includes manufacture, fabrication (if needed), supply, and installation of geocomposite drainage layers. The geocomposite will consist of a layer of geotextile thermally bonded to each side of a geonet. Requirements for geotextiles are contained in Section 2.2 GEOTEXTILES, of these Specifications. Requirements for geonets and the finished geocomposite are contained in this section.

2.3.1 Composition

The geonet shall be high density polyethylene (HDPE).

The geocomposite shall consist of Type A geotextile 100% thermally bonded to each side of the HDPE geonet.

2.3.2 Manufacturer

The Geocomposite Manufacturer shall have a minimum of five years experience as a commercial manufacturer of geocomposites for landfill drainage applications.

2.3.3 Geocomposite Properties

2.3.3.1 Geonet. Geonet properties shall meet or exceed the values specified in the table titled "Required Geonet Properties".

2.3.3.2 Geotextile. Geotextile properties shall meet or exceed the values specified in the referenced table.

2.3.3.3 Manufacturer's Certification. The Manufacturer shall provide specification sheets, literature and test results for properties listed in these Specifications.

The Manufacturer shall certify that the materials supplied meet the requirements of this Technical Specification.

2.3.4 Integrity

Geonets and Geocomposites shall retain their structure during handling, placement, and long-term service. Unbonded areas of geotextile to geonet shall be subject to rejection.

2.3.5 Geocomposite Conformance Testing

Prior to shipment, the CQA Subcontractor shall obtain samples and perform testing in accordance with the Construction Quality Assurance Plan. The CQA Subcontractor will test the samples to determine conformance to both the design specifications and the list of guaranteed properties.

2.3.6 Geocomposite, Handling, and Storage

Geocomposite shall be fabricated prior to transporting and shall be supplied in rolls wrapped in protective dust-proof covers and marked or tagged with of the following information:

- a. Manufacture's name.
- b. Product identification.
- c. Lot number.
- d. Roll number.
- e. Roll dimensions.

Transportation and handling of the geocomposite will be the responsibility of the SUBCONTRACTOR. Geocomposites shall be stored on a prepared subgrade, free of rocks, and graded to drain away from stored materials.

During shipment and storage, the geocomposite shall be protected from mud, dirt, dust, puncture, cutting, moisture, or other damaging or deleterious conditions.

The SUBCONTRACTOR shall be responsible for the storage and protection of the geocomposite materials. Geocomposite stockpile shall be covered with a tarp to protect from all sunlight, dust and precipitation.

2.4 GEOSYNTHETIC PENETRATIONS

Materials for Geosynthetic penetrations shall be in conformance to ASTM D6497.

3.0 EXECUTION

3.1 GENERAL

3.1.1 Unacceptable Materials and Work

Materials and work that fail to meet the requirements of the Subcontract shall be removed and disposed of at the SUBCONTRACTOR's expense.

3.1.2 Personnel Qualifications

3.1.2.1 Installer Organization. At a minimum, the Geosynthetics Installer shall have successfully completed at least 10 projects consisting of installation of at least 10,000,000 ft² (total) of HDPE liner. Projects shall include Resource Conservation and Recovery Act (RCRA) landfills and surface impoundments.

3.1.2.2 Seaming Personnel. Personnel performing seaming operations shall be qualified by experience or by successfully passing seaming tests similar to those described in this Technical Specification. The superintendent and lead welder foreman shall have experience seaming a minimum of 2,000,000 ft² of polyethylene geomembrane using the same type of seaming apparatus proposed for use on this project. These individuals shall provide direct supervision over less experienced seamers. No field seaming shall take place without one of these individuals being present in the cell area.

3.1.3 Applicability

Geosynthetic materials shall be installed at the locations, lines and grades shown on the Drawings. Liners shall be installed in accordance with the Subcontract.

3.1.4 Installation Plan

The SUBCONTRACTOR shall submit a plan describing the proposed methods for unloading, storage, deployment, panel layout, seaming, testing, repair, and protection. This shall include the type and weight of any equipment proposed for deployment and detailed methodology for installation over existing admix and geosynthetics to prevent damage.

3.2 ANCHOR TRENCH EXCAVATION AND BACKFILLING

The anchor trench shall be excavated to the lines and widths shown on the Drawings, prior to geosynthetics installation. All areas in contact with the geomembrane shall be rounded with a minimum 6 inch radius so as to avoid sharp bends in the geosynthetic. No loose soil shall be allowed to underlie the geomembrane in the anchor trench. All CQA and CQC activities shall continue through the anchor trench.

Geosynthetics shall be anchored as shown on the Drawings. The backfill material and placement method shall be as described in Specification 0600X-SP-C0075.

3.3 GEOMEMBRANE PLACEMENT - HDPE GEOMEMBRANE

3.3.1 Field Panel Identification

A field panel is the unit area of geomembrane that is to be seamed in the field.

- a. A field panel is a roll or a portion of roll cut in the field that is in intimate contact with the underlying material (as opposed to a patch).

The CQA Subcontractor and SUBCONTRACTOR shall agree on a numbering system and assign each field panel an "identification code" consistent with the layout plan. This field panel identification code shall be as simple and logical as possible. (Note that roll numbers assigned in the manufacturing plant are usually cumbersome and are not related to location in the field.)

The CQA Subcontractor will establish a table or chart showing correspondence between roll numbers, factory panels, and field panel identification codes. The field panel identification code shall be used for CQC and CQA.

3.3.2 Field Panel Placement

3.3.2.1 Location. Field panels shall be installed at the locations indicated in the SUBCONTRACTOR layout plan, approved by the CONTRACTOR with white side up.

3.3.2.2 Installation Schedule. Panels deployed shall be continuously welded the same day deployed.

3.3.2.3 Geomembrane Handling and Placement

- a. The SUBCONTRACTOR shall handle geomembranes in such a manner as to ensure it is not damaged. Dragging or pulling of geomembrane over subgrade will not be allowed, such that the "texture" gets rubbed off. A rub sheet may be used upon the approval of the CONTRACTOR.
- b. In the presence of wind, exposed geomembrane shall be weighted with ultraviolet resistant sandbags or as approved. Sandbags shall be installed during placement and shall remain until replaced with cover material. CONTRACTOR's equipment shall not be used to weight down geomembranes.
- c. Geomembranes shall be cut using an approved geomembrane cutter only. Underlying geosynthetic materials shall not be damaged during cutting.
- d. After installation, the geomembrane shall be examined over its entire surface to ensure that no potentially harmful foreign objects, such as needles, rocks, debris, etc are present. Any foreign objects encountered shall be removed.
- e. Vehicles will not be permitted on geomembrane unless approved by CONTRACTOR.
- f. Precautions shall be taken against "snow blindness" of personnel working on the white geomembrane.

3.3.3 Placement Conditions

Geomembrane placement shall not proceed at an ambient temperature below 32 degrees F or above 104 degrees F as measured 12 inches above the geomembrane surface, unless otherwise authorized by the CONTRACTOR. Geomembrane placement shall not be done during any precipitation, in the presence of excessive moisture (e.g., snow, ice, fog, dew), in an area of ponded water, or in the presence of winds over 20 mph. Placement methods shall prevent damage to underlying admix or geosynthetic materials. Driving directly on any geosynthetic layer is not allowed, unless approved in advance by the CONTRACTOR as part of the installation plan.

3.3.4 Damage

The SUBCONTRACTOR and the CQA Subcontractor shall inspect each panel, after placement and prior to seaming, for damage. The CQA Subcontractor will advise the SUBCONTRACTOR which panels, or portions of panels, shall be rejected, repaired, or accepted. Damaged panels or portions of damaged panels that have been rejected shall be removed from the work area. Repairs shall be made according to procedures approved by the CONTRACTOR.

3.4 FIELD SEAMING

3.4.1 Seaming Equipment and Products

Approved seaming methods are extrusion welding and single or dual track fusion welding. Fusion welding shall be utilized for tie-in seams between existing and new geomembrane. Seaming shall be a continuous process with a minimum of interruptions along any given seam. The Installer shall maintain at least two operable spare seaming units on site. Extrusion welding shall be limited to repairs and tie-ins. Proposed alternate processes shall be documented and submitted to the CONTRACTOR for approval. Only equipment that has been specifically approved by make and model shall be used.

3.4.1.1 Extrusion Process. The extrusion-welding machine shall be equipped with gages capable of measuring the temperature at the nozzle or the preheat temperature.

The SUBCONTRACTOR shall provide documentation regarding the extrudate to the CQA Subcontractor and shall certify that the extrudate is compatible with these Specifications and is comprised of the same resin type as the geomembrane sheeting.

The SUBCONTRACTOR shall comply with the following:

- a. Maintain a sufficient number of spare operable seaming machines (at least two spare extrusion seaming machines) on site to ensure continuous operation. Spare parts and consumables also shall be maintained on site.
- b. The equipment used for seaming shall not damage the geomembrane.
- c. The extruder shall be purged prior to beginning a seam until heat-degraded extrudate has been removed from the barrel.
- d. Seaming machine and support equipment (electric generators, miscellaneous tools, etc.) shall be placed on a geomembrane rub sheet base such that no damage occurs to the geomembrane.
- e. Grinding shall be completed no more than 1 hour prior to seaming.
- f. A smooth insulating plate or fabric shall be placed beneath the hot welding machine after usage.
- g. The geomembrane shall be protected from damage.

3.4.1.2 Fusion Process. The fusion-welding machines shall be automated self-propelled devices. The fusion-welding machines shall be equipped with gauges giving the applicable temperatures.

The SUBCONTRACTOR shall comply with the following:

- a. Maintain a sufficient number of spare operable seaming machines (at least two spare fusion seaming machines) on site to ensure continuous operations. Spare parts and consumables also shall be maintained on site.
- b. The equipment used for seaming shall not damage the geomembrane.
- c. The seaming machine and support equipment (electric generators, compressors, vacuum pumps, miscellaneous tools, etc.) shall be placed on a geomembrane rub sheet base such that no damage occurs to the geomembrane.
- d. A smooth insulating plate of fabric shall be placed beneath the hot welding machine after usage.
- e. The geomembrane shall be protected from damage.
- f. A movable protective layer may be used directly below each overlap of geomembrane to be seamed to prevent buildup of moisture between the sheets. At no time can this protective layer be left in place.

3.4.2 Seam Layout

The SUBCONTRACTOR shall provide the CONTRACTOR and the CQA Subcontractor with a seam layout drawing, i.e., a drawing of the facility to be lined showing expected seams. The CQA Subcontractor will review the seam layout drawing and confirm that it is consistent with accepted state of practice. No panels shall be seamed in the field without the CONTRACTOR's approval. No panels not specifically shown on the seam layout drawing shall be used without the CONTRACTOR's prior approval.

In general, seams shall be oriented parallel to the line of maximum slope, i.e., oriented along, not across, the slope and over laps shall be shingled down the slope. In corners and odd-shaped geometric locations, the number of seams shall be minimized. On the landfill floor, no horizontal seam shall be less than 5 feet from the toe of the slope, or other area of potential stress concentrations, unless otherwise authorized by the CONTRACTOR. The geomembrane shall not have horizontal seams on the side slopes.

On slopes or grades steeper than ten percent, seams shall be oriented down and not across the slope. No horizontal seam shall be less than 5 feet from the top of the slope or other area of potential stress concentration. Seams shall not line up with leachate piping runs. The number of field seams shall be minimized in areas such as corners and odd-shaped geometric locations. In anchor trenches, the geomembrane shall be continuous through the trench, over the crest, and down the slope.

Seams shall be aligned to produce the fewest possible number of wrinkles and "fishmouths".

A seam numbering system consistent with the panel numbering system shall be established by the CQA Subcontractor and SUBCONTRACTOR prior to liner installation. This system shall be submitted to the CONTRACTOR.

3.4.3 Weather Conditions for Seaming

The allowable weather conditions for seaming are as follows:

- a. Unless authorized in writing by the CONTRACTOR, no seaming shall be attempted at ambient temperatures below 32 degrees F or above 104 degrees F as measured 12 inches above the liner. The CQA Subcontractor will confirm that these weather conditions are fulfilled and will advise the SUBCONTRACTOR if they are not. The CONTRACTOR will then decide if the installation will be postponed or if modified procedures shall be used.
- b. The geomembrane shall be dry, protected from wind, and free of dust.

If the Installer wishes to use methods that will allow seaming at ambient temperatures below 32 degrees F, the SUBCONTRACTOR shall certify in writing that the quality of the seams welded at these temperatures is the same as the quality of seams welded at temperatures above 32 degrees F as measured 12 inches above the geomembrane surface, unless otherwise authorized by the CONTRACTOR. In addition, if the SUBCONTRACTOR wishes to seam at ambient temperatures below 32 degrees F the following conditions shall be satisfied in addition to the general seaming procedures:

- a. For extrusion welding, preheating shall be performed. Preheating may be waived, if it is demonstrated to the satisfaction of the CQA Subcontractor that welds of equivalent quality may be obtained without preheating.
- b. Preheating equipment shall be approved by the CONTRACTOR prior to use.
- c. Sheet grinding, if required, may be performed before preheating.
- d. The CQA Subcontractor will observe areas of the geomembrane that have been preheated to determine if subjected to excessive melting.
- e. The SUBCONTRACTOR and CQA Subcontractor shall confirm that geomembrane surface temperatures have not decreased below the minimum specified for welding, due to wind or other adverse conditions. Wind protection for the seam area may be required by the SUBCONTRACTOR.
- f. Trial seams shall be made in the immediate area where seaming will occur, under the same subgrade and same ambient temperature and preheating conditions as the actual seams. New trial seams shall be made if the ambient temperature

decreases by more than 5 degrees F from the previous trial seam conditions. Such new trial seams shall be conducted at the end of the seam in progress during the temperature drop.

- g. Additional destructive seam tests may be performed by the SUBCONTRACTOR at the CQA Subcontractor's discretion.
- h. The SUBCONTRACTOR shall test sample coupons cut from each end of the seam. The CQA Subcontractor will observe the installer testing these coupons in the field.
- i. Testing required by these Specifications or the CQA Plan shall also be performed on seams fabricated at temperatures below 32 degrees F.

3.4.4 Seam Preparation

3.4.4.1 Cleaning. Prior to seaming, the seam area shall be clean and free of moisture, dust, dirt, debris of any kind, and foreign material. Special attention shall be paid to cleaning the existing geomembrane at tie-in locations. Cleaning shall not damage the liner.

3.4.4.2 Overlap. Cross slope seams on both the trench floor and sidewalls shall be overlapped so that liquids are not trapped, i.e., seams shall be shingled down slope.

If seam overlap grinding is required, the process shall be completed according to the Geomembrane Manufacturer's instructions within one hour of the seaming operation and not damage the geomembrane. SUBCONTRACTOR shall submit procedures to perform seam grinding.

Panels of geomembrane shall have a finished overlap as recommended by the manufacturer. However, in any event sufficient overlap shall be provided to allow peel and shear tests to be performed on the seam.

Prior to seaming, geomembrane rolls or panels shall be overlapped a minimum of 3 inches for extrusion welding and 5 inches for fusion welding or as recommended by manufacturer.

3.4.4.3 Use of solvents. No solvent or adhesive shall be used.

3.4.4.4 Temporary Bonding. The procedure used to temporarily bond adjacent panels together shall not damage the geomembrane; in particular, the temperature of hot air at the nozzle of any spot welding apparatus shall be controlled such that the geomembrane is not damaged.

3.4.5 General Seaming Procedures

The general seaming procedure used by the SUBCONTRACTOR shall be as follows:

- a. Seaming shall extend to the outside edge of panels to be placed in the anchor trench.
- b. A firm substrate shall be provided by using a flat board, a conveyor belt, or similar hard surface directly under the seam overlap to achieve proper support.
- c. If seaming operations are carried out at night, 5 foot-candles of lighting is required by OSHA and shall be provided by SUBCONTRACTOR for workers as well as the CONTRACTOR and CQA Subcontractor.
- d. "Fishmouths" or wrinkles at the seam overlaps shall be cut along the ridge of the wrinkle in order to achieve a flat overlap. The cut "fishmouths" or wrinkles shall be seamed, and any portion where the overlap is inadequate shall then be patched with an oval or round patch of the same geomembrane extending a minimum of 6 inches beyond the cut in each direction.
- e. When seaming of the geomembrane liner has been completed and prior to placing overlying materials, the CQA Subcontractor will observe the geomembrane for wrinkles. The SUBCONTRACTOR and CQA Subcontractor will indicate which wrinkles shall be cut and seamed or otherwise repaired by the SUBCONTRACTOR. The resulting seam(s) shall be tested like any other seam.
- f. Geomembrane in sump areas shall be installed and tested. Extreme care shall be taken while welding around appurtenances since neither nondestructive nor destructive testing may be feasible in these areas. The Installer shall ensure that the geomembrane is not visibly damaged during installation.

3.5 GEOMEMBRANE SEAM TESTING

Training and qualification procedures and records shall be submitted to the CONTRACTOR.

SUBCONTRACTOR shall submit vacuum, air, and non destructive testing procedures for CONTRACTOR approval.

Testing records shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

3.5.1 Trial Seams

Trial seams shall be made on fragment pieces of geomembrane liner to verify that seaming conditions are adequate. Trial seams shall be made at the beginning of each seaming period, and at least once each four hours, for each seaming machine and operator used that day and shall be made in the presence of the CQA Subcontractor. This frequency may be increased at the direction of the CQA Subcontractor. Trial seams shall be made under the same conditions and on the same subgrade as actual seams.

Trial welds shall be conducted for different material types. (i.e. smooth to smooth, smooth to textured and textured to textured)

The trial seam sample shall be at least 2 feet long by 1 foot wide (after seaming) with the seam centered lengthwise. Seam overlap shall be as indicated in this Technical Specification.

Six adjoining specimens, each 1 inch wide, shall be cut from the trial seam sample by the SUBCONTRACTOR. The specimens shall be alternately tested in shear and peel using a calibrated field tensiometer, and they shall not fail in the seam. If a specimen fails, the entire trial seaming operation for the failed configuration shall be repeated. If the additional specimen fails, the seaming apparatus and seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful full trial seams are achieved. Records of trial seam testing shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

Test equipment shall be in calibration and conform to manufacturer's specifications. The SUBCONTRACTOR shall provide the CONTRACTOR with current calibration certificates.

3.5.2 Nondestructive Seam Continuity Testing

3.5.2.1 General. The SUBCONTRACTOR shall nondestructively test field seams over their full length using a vacuum test unit, air pressure test (for double fusion seams only), or other approved method. Vacuum testing and air pressure testing are described below. The purpose of the nondestructive test is to check the continuity of seams. It does not provide any information on seam strength. Continuity testing shall be done as the seaming work progresses.

Any seams that fail nondestructive testing shall be repaired in accordance with these Specifications. Seams that cannot be nondestructively tested because of seam geometry shall be double welded or capped. Records of repair seam testing shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

Test equipment shall be in calibration and conform to manufacturer's specifications. The SUBCONTRACTOR shall submit current calibration certificates.

3.5.2.2 Vacuum Testing (ASTM D5641). The equipment shall be comprised of the following:

- a. A vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, port hole or valve assembly, and a vacuum gage.
- b. A steel vacuum tank and pump assembly equipped with a pressure controller and connections.
- c. A rubber pressure/vacuum hose with fittings and connections.

- d. A bucket and wide paint brush.
- e. A soapy solution.

The following procedures shall be used:

- a. Energize the vacuum pump and reduce the tank pressure to a minimum of 5 inches of mercury.
- b. Wet a strip of geomembrane approximately 12 inches wide by 48 inches long with the soapy solution. The soapy solution shall not dry before the area is vacuum tested.
- c. Place the vacuum box over the test area.
- d. Close the bleed valve and open the vacuum valve.
- e. Ensure that a leak tight seal is created.
- f. For a period of not less than 10 seconds, examine the geomembrane through the viewing window for the presence of soap bubbles.
- g. If no bubble appears after 10 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inch overlap, and repeat the process.
- h. Areas where soap bubbles appear shall be marked and repaired in accordance with the Technical Specifications.

3.5.2.3 Air Pressure Testing (ASTM D5820). The following procedures are applicable only to those processes that produce a double seam with an enclosed air channel. All double seams with an enclosed air channel shall be air pressure tested. The equipment shall be comprised of the following:

- a. An air pump (manual or motor driven) capable of generating and sustaining a pressure of at least 40 psi.
- b. A rubber hose with fittings and connections.
- c. A sharp hollow needle, or other approved pressure feed device.
- d. A calibrated pressure gage in 1 psi increments capable of reading pressures up to 40 psi.

The following procedures shall be used:

- a. Seal both ends of the seam to be tested.
- b. Insert needle with pressure gauge, or other approved pressure feed device, into the air channel created by the fusion weld.
- c. If the seam is 1/2-inch wide, energize the air pump and pressurize the channel to a minimum of 30 psi. Close the valve and sustain the pressure for a minimum of 5 minutes.
- d. If a pressure loss greater than 2 psi is observed at either end or if the required pressure cannot be reached, then the seam shall be rejected. If the seam does not stabilize, locate faulty area and repair in accordance with this section. If, in the judgment of the CQA Subcontractor, significant changes in geomembrane temperature occur during the test (e.g., due to cloud cover), the test shall be repeated after the geomembrane temperature has stabilized.
- e. Cut end of seam opposite to the pressure gage and observe that the pressure drops. If the pressure does not drop, locate the obstruction(s) in the seam, repair, and retest seam.
- f. Remove needle or other approved pressure feed device and repair seam.
- g. Faulty areas along the seam shall be identified, repaired in accordance with approved procedures, and retested. Holes created during nondestructive testing shall be repaired in accordance with approved procedures as described in the Specifications upon completion of the test.
- h. Gauges shall be calibrated annually, at the project beginning, and at the discretion of the CONTRACTOR.

3.5.3 Destructive Seam Strength Testing

3.5.3.1 General. Destructive seam tests shall be performed at selected locations. The purpose of these tests is to evaluate seam strength. Seam strength testing shall be done as the seaming work progresses. The samples shall meet the requirements of the table titled "Required Seam Properties".

Test equipment shall be in calibration and conform to manufacture's specifications. The SUBCONTRACTOR shall submit current calibration certificates.

3.5.3.2 Location and Frequency. The CQA Subcontractor will select locations where seam samples shall be removed for laboratory testing by the SUBCONTRACTOR.

Sampling frequency shall be a minimum of one sample per 492 feet of seam length per welding machine per day (this minimum frequency shall be determined as an average taken from the panels, including welds for caps), or a minimum of two samples per factory panel, whichever gives the largest number of samples. This frequency may be increased at the discretion of the CQA Subcontractor or CONTRACTOR.

3.5.3.3 Sampling Procedures. Samples shall be cut by the SUBCONTRACTOR as the seaming progresses to provide laboratory test results before completion of installation. The SUBCONTRACTOR shall assign a number to each sample, mark it accordingly, and record the sample location on the layout drawing.

Holes in the geomembrane resulting from destructive seam sampling shall be immediately repaired in accordance with repair procedures. The continuity of the new seams in the repaired area shall be tested as described in this Technical Specification.

3.5.3.4 Sample Size. The samples shall be 12 inches wide by 42 inches long with the seam centered lengthwise. One 1 inch wide strip shall be cut from each end of the samples, and these shall be tested in the field as described below. The remaining sample shall be cut into three parts and distributed as follows:

- a. One portion to the SUBCONTRACTOR for testing at his discretion, 12 inches x 12 inches.
- b. One portion to the CONTRACTOR for archive storage, 12 inches x 12 inches.
- c. One portion to the CQA Subcontractor for testing, 12 inches x 16 inches.

3.5.3.5 Field Testing. The two 1 inch wide strips described above shall be tested in the field by tensiometer for peel and shear and shall not fail in the seam. If any test sample fails to pass, then the procedures outlined below (Procedures for Destructive Test Failure) shall be followed.

The CQA Subcontractor will mark samples and portions with their number. The CQA Subcontractor will also record the date and time, ambient temperature, number of seaming unit, name of seamer, welding apparatus temperatures and pressures, and pass or fail descriptions, and attach a copy to each sample portion.

3.5.3.6 Procedures for Areas Failing Destructive Tests. The following procedures shall apply whenever a sample fails a destructive test, whether that test is conducted by the CQA Laboratory, the SUBCONTRACTOR's laboratory, or by field tensiometer. The SUBCONTRACTOR has two options:

- a. Cap the seam or replace the seam between any two passing test locations, or
- b. Trace the seam to two intermediate locations 10 feet minimum from the point of the failed test in each direction and take a small sample for an additional field test

at each location. If these additional samples pass the test, then full samples shall be taken for CQA laboratory testing. If these laboratory samples pass the tests, then the seam shall be capped or replaced between these locations. If either sample fails, then the sampling and testing process shall be repeated to establish the zone over which the seam shall be capped.

When possible all acceptable capped or replaced seams shall be bounded by two locations from which samples passing CQA laboratory destructive tests have been taken. If all welding for a machine has been capped or replaced, it is not always possible to get a passing sample. The CQA Subcontractor will decide whether or not taking a sample from the capping seam for destructive testing is warranted.

3.6 REPAIRS

3.6.1 General

Any portion of the geomembrane exhibiting a flaw or failing a destructive or nondestructive test shall be repaired. Repairs shall be conducted in accordance with this technical specification and shall be subjected to the nondestructive seam testing procedures. All damage that fully penetrates the layers shall be repaired with a patch.

Each patch or other type of repair shall be numbered and recorded and documentation shall be reviewed and approved by the CQA Subcontractor.

SUBCONTRACTOR training and qualification procedures and records shall be submitted to the CONTRACTOR.

SUBCONTRACTOR shall submit repair procedures for CONTRACTOR approval.

Repair records shall be maintained by the SUBCONTRACTOR and be available for CQA Subcontractor and CONTRACTOR inspection.

Repairs are to be performed at the SUBCONTRACTOR's expense.

3.6.2 Repair Procedures

Several procedures exist for repair. The decision as to the appropriate repair procedure, materials, and equipment shall be agreed upon in advance between the SUBCONTRACTOR, and CQA Subcontractor. Potentially acceptable procedures include:

- a. Patching, used to repair large holes, tears, undispersed raw materials, and contamination by foreign matter.
- b. Grinding and rewelding, used to repair small sections (typically with a maximum length of no more than several inches) of extruded seams.

- c. Spot welding or seaming used to repair pinholes or other minor, localized flaws.
- d. Capping, used to repair large lengths of failed seams.
- e. Topping, used to repair areas of inadequate seams, which have an exposed edge.
- f. Removing bad seam and replacing with a strip of new material welded into place, used with large lengths of fusion seams.

For repair methods, the following provisions shall be satisfied as applicable:

- a. Surfaces of the geomembrane that are to be repaired by extrusion welding shall be abraded no more than one hour prior to the repair.
- b. Surfaces shall be clean and dry at the time of the repair.
- c. Patches or caps shall extend at least 6 inches beyond the edge of the defect, and each corner of a patch or cap shall be rounded with a radius of at least 3 inches.
- d. The geomembrane below large caps shall be appropriately cut to avoid water or gas collection between the two sheets.

3.6.3 Verification of Repairs

Each repair shall be numbered and recorded. Each repair shall be nondestructively tested and recorded using the methods described in this Technical Specification. Large caps may be of sufficient extent to require destructive test sampling, at the discretion of the CQA Subcontractor. Repairs that fail nondestructive or destructive tests shall be redone and retested until a passing test is obtained. The CQA Subcontractor shall observe non-destructive testing of repairs and will record the number of each repair, date, and test results. CQA Subcontractor will determine if destructive samples are required on any repairs.

3.7 MATERIALS IN CONTACT WITH GEOMEMBRANE

Requirements of this section apply to geomembranes that are directly in contact with overlying soil or are covered with a layer of geotextile or geocomposite.

The requirements of this section are intended only to assure that the installation of other materials does not damage the geomembrane. Additional requirements as established in other sections of these specifications are to assure that systems built with these other materials are constructed in such a way as to provide proper performance.

3.7.1 Temperature

Do not place granular materials on the geomembrane at ambient temperatures below 32 degrees F or above 104 degrees F as measured 12 inches above the geomembrane surface.

3.7.2 Minimum Thickness

Equipment used for placing granular material shall not be driven directly on the geomembrane. A minimum thickness of 1 foot of granular material shall be maintained between placement equipment and the geomembrane. A minimum thickness of 3 feet of granular material shall be maintained between rubber-tired hauling vehicles and the geomembrane. Equipment and minimum material thicknesses shall be closely monitored to verify that no loads exceed a ground contact pressure of more than 5 psi measured 12 inches above the geosynthetics.

3.7.3 Spreading Equipment

Equipment used for placing or spreading granular material shall be as specified in 0600X SP-C0078.

3.7.4 Spreading Operations

Equipment used for spreading granular material shall be as specified in 0600X-SP-C0078. Placement of operations layer soil materials on the geomembrane will not be allowed within 50 feet of any unseamed edge of geomembrane.

3.8 LINING SYSTEM ACCEPTANCE

The SUBCONTRACTOR shall retain ownership of and responsibility for the lining system until acceptance by the CONTRACTOR.

The geosynthetic lining system will be accepted by the CONTRACTOR when the following requirements have been satisfied:

- a. The installation is finished.
- b. Verification of the adequacy of field seams and repairs, including associated testing is complete.
- c. A written construction report, including "as built" drawings and installation documents and CQC documents have been prepared by the CQA Subcontractor, sealed by a registered professional engineer, and approved by the CONTRACTOR.
- d. The requirements of the GENERAL CONDITION titled FINAL INSPECTION AND ACCEPTANCE have been satisfied.

- e. SUBCONTRACTOR records, submittals, etc. are provided.

3.9 GEOTEXTILES

3.9.1 Installation Plan

The SUBCONTRACTOR shall submit a plan describing the proposed methods for geotextile unloading, storage, deployment, panel layout, seaming, testing, repair, and protection.

Materials and work that fail to meet the requirements of this specification section for geotextiles shall be removed and disposed of at the SUBCONTRACTOR's expense. This includes geotextile rolls that are not labeled or where the label has deteriorated to the point of being illegible.

3.9.2 Geotextile Handling and Placement

- a. Protective wrapping shall be removed less than 1-hour prior to unrolling the material.
- b. The SUBCONTRACTOR shall handle geotextiles in such a manner as to ensure that they are not damaged. Do not drag the geotextile across textured geomembrane. If necessary, use a smooth slip sheet under the textile. Position the geotextile after deployment and remove the slip sheet, if used.
- c. Place geotextiles in a manner that prevents folds and wrinkles. Folds or wrinkles shall be pulled smooth prior to seaming.
- d. In the presence of wind, exposed geotextiles shall be weighted with ultraviolet resistant sandbags or as approved. Sandbags shall be installed during placement and shall remain until replaced with cover material.
- e. Geotextiles shall be cut using an approved geotextile cutter only. Underlying geosynthetic materials shall not be damaged during cutting.
- f. During geotextile placement, stones, excessive dust, or moisture that could damage the geomembrane, clog drains or filters, or hamper subsequent seaming shall be removed.
- g. After installation, the geotextile shall be examined over its entire surface to ensure that no potentially harmful foreign objects, such as needles, rocks, debris, etc are present. Any foreign objects encountered shall be removed.
- h. Vehicles shall not be permitted on the geotextile unless approved by CONTRACTOR.

- i. If light colored geotextile is used, precautions shall be taken against "snow blindness" of personnel.
- j. After deployment, geotextile shall be covered to prevent exposure to ultraviolet (UV) radiation (sunlight) within a maximum period of 14 calendar days.

3.9.3 Seaming

- a. Geotextiles shall be overlapped a minimum 3 inches prior to seaming.
- b. Geotextiles shall be continuously sewn (i.e., spot sewing is not allowed). Alternatively, single or double wedge fusion welding will be acceptable. The CQA requirements for welding will be the same as for sewing. Leister welding (spot or continuous) will not be accepted as a replacement for sewing.
- c. No horizontal seams shall be allowed on side slopes (i.e., seams shall be along, not across, the slope) provided rolls can be manufactured of sufficient length, except as part of a patch.
- d. On the landfill floor, no horizontal seam shall be closer than 3 feet to the toe of the slope or other areas of potential stress concentrations unless authorized in writing by the CONTRACTOR.
- e. Areas to be seamed shall be clean and free of foreign material.
- f. Sewing shall be done using polymeric thread with chemical resistance properties equal to or exceeding those of the geotextile, or as approved by the CONTRACTOR. The manufacturer shall provide written certification that the thread complies with the specifications.
- g. Sewing shall be done using a sewing machine that creates a chain stitch. When entering and exiting a seam, the stitches shall be overlapped to prevent unraveling.
- h. SUBCONTRACTOR training and qualification procedures for sewing shall be submitted to the CONTRACTOR.

3.9.4 Geotextile Repair

Any holes or tears in the geotextile shall be repaired as follows:

- a. Remove any soil or other material that may have penetrated the torn geotextile.

- b. A patch made from the same geotextile shall be double seamed into place with the seams 1/4 inch to 3/4 inch apart and no closer than 1 inch from any edge. The patch shall extend at least 12 inches beyond the edges of the damaged area. Lyster welding may be used for geotextile patch repairs based on CONTRACTOR approval.

3.9.5 Materials in Contact with Geotextiles

The SUBCONTRACTOR shall place soil materials located on top of a geotextile in such a manner as to ensure that the following conditions are satisfied:

- a. No damage to the geotextile.
- b. Minimal slippage of the geotextile on underlying layers.
- c. No excess tensile stresses in the geotextile.

3.10 GEOCOMPOSITES

Materials and work that fail to meet the requirements of these specifications shall be removed, disposed of, and replaced at the SUBCONTRACTOR's expense.

3.10.1 Installation Plan

The SUBCONTRACTOR shall submit a plan describing the proposed methods for geocomposite unloading, storage, deployment, panel layout, seaming, testing, repair, and protection.

3.10.2 Handling and Placement

- a. Protective wrapping shall be removed less than 1-hour prior to unrolling.
- b. The SUBCONTRACTOR shall handle geocomposites in such a manner as to ensure that these materials are not damaged.
- c. Clean geomembrane surface prior to placing geocomposite to remove dust, dirt and debris.
- d. On slopes, geocomposite may be deployed over slip-sheets with the roll at the top of the slope. An alternative method is to secure the geocomposite and then roll it down slope in a manner to continually keep it in tension if necessary, position the geocomposite after deployment to minimize wrinkles and remove the slip sheet, if used.
- e. Do not drag the geocomposite across textured geomembrane.

- f. In the presence of wind, exposed geocomposites shall be weighted with ultraviolet resistant sandbags or equivalent. Sandbags shall be installed during geocomposite placement and shall remain until replaced with cover material.
- g. Unless otherwise specified, geocomposites shall not be welded to geomembranes.
- h. Geocomposites shall only be cut using approved cutting tool.
- i. The SUBCONTRACTOR shall take necessary precautions to prevent damage to underlying layers during placement of the geocomposite.
- j. During placement of geocomposites, care shall be taken not to entrap dirt or excessive dust that could cause clogging of the drainage system, and/or stones that could damage the adjacent geomembrane if dirt or excessive dust is entrapped in the geocomposite, it shall be cleaned prior to placement of the next material on top of it.
- k. Vehicles shall not be permitted on the geocomposite unless approved by CONTRACTOR.
- l. Tools shall not be left on or under the geocomposite.
- m. In geocomposites, tearing the geotextile away from the geonet shall not be allowed except at seam locations in corners as approved by the CQA Subcontractor.
- n. After deployment, geocomposite shall be covered to prevent exposure to ultraviolet (UV) radiation (sunlight) within a maximum period of 14 calendar days.

3.10.3 Joining

- a. Adjacent sections of geocomposite shall be overlapped according to manufacturer's directions.
- b. Overlaps shall be secured by tying. Acceptable tying devices include plastic fasteners, or polymer braid. Tying devices shall be white or yellow for easy observation. Metallic joining devices are not allowed.
- c. Overlaps shall be secured every 5 feet along slopes and on the floor of the landfill and every 6 inches in the anchor trenches. Along end-to-end seams, spot weld and tie 2 rows 3 inches apart. Spot weld and tie each row at 6 inch intervals; stagger weld or ties between rows.

- d. No horizontal seams shall be allowed on side slopes provided rolls can be manufactured to sufficient length. If required because of manufacturing limitation end seams shall be staggered.
- e. If more than one layer of geocomposite is installed, joints shall be staggered.
- f. Top geotextile component of the geocomposite shall be sewn.

3.10.4 Repair

Generally holes or tears in the geonet shall be repaired by placing a patch extending 2 feet beyond the edges of the hole or tear. Ribs in the patch shall be parallel to ribs in the existing geonet. The patch shall be secured to the original geonet by spot welding or tying every 6 inches using tying devices as indicated above. If the hole or tear width across the roll is more than 50 percent the width of the roll, the damaged area shall be cut out and the two portions of the geonet shall be joined as described in the specifications.

- a. Remove the damaged or unbonded area of geocomposite.
- b. Cut a piece of geocomposite to fit over the repair area. Geocomposite shall fit over repair area and shall be tied similar to end to end seams.
- c. Remove any dirt or other foreign material that may have entered the geocomposite.
- d. Geocomposite damage greater than 4 square feet shall require removal of full roll width of damaged area.

3.10.5 Materials in Contact with Geocomposites

The SUBCONTRACTOR shall place soil materials located on top of a geocomposite layer in such a manner as to ensure that the following conditions are satisfied:

- a. No damage to the geocomposite.
- b. No slippage of the geocomposite on underlying layers.
- c. No excess tensile stresses in the geocomposite.

Placement of soil materials shall begin at the bottom of side slopes and progress upslope or laterally at about the same elevation such that a full layer of material is covering the geosynthetics downslope from the area being covered.

3.11 GEOSYNTHETIC PENETRATIONS

Geosynthetic penetrations shall be installed per ASTM D6497.

3.12 QUALITY ASSURANCE/QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

Records shall include, but not be limited to the following:

- (1) Calibration of seaming and testing equipment. Calibration shall be at manufacturers' recommended intervals or whenever rough handling, damage, or other factors indicate that accuracy may have been compromised. Methods used for calibration shall conform to manufacturers' recommendations. Secondary standards shall be traceable to national standards.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory shall be furnished to the CONTRACTOR within one working day following the inspection or test.

Table 1
High Density Polyethylene (HDPE) Geomembrane – 60 mil Textured

Properties	Test Method	Manufacturer QC Test Frequency	Required Test Values
Thickness (min. avg.) • Minimum individual	ASTM D5994	1 per Roll	60 mil 57 mil
Asperity Height (min. avg.) ⁽¹⁾	ASTM D7466	1 per 50,000 ft ²	20 mil
Sheet Density (min)	ASTM D792 or ASTM D1505	1 per 50,000 ft ²	0.940 g/cc
Tensile Properties ⁽²⁾ (min. avg.) • Yield strength • Break strength • Yield elongation • Break elongation	ASTM D6693	1 per 50,000 ft ²	126 lb/in 90 lb/in 12% 100%
Tear Resistance (min. avg.)	ASTM D1004 Die C	1 per 50,000 ft ²	42 lbs
Puncture Resistance (min. avg.)	ASTM D4833	1 per 50,000 ft ²	90 lbs
Stress Crack Resistance ⁽³⁾	ASTM D5397 (App.)	(11)	300 hours
Carbon Black Content (range)	ASTM D1603 ⁽⁴⁾	1 per 50,000 ft ²	2-3%
Carbon Black Dispersion ⁽⁵⁾	ASTM D5596	1 per 50,000 ft ²	Category 1,2, or 3 ⁽⁵⁾
Oxidative Induction Time (OIT) (min. avg.) ⁽⁶⁾ • Std. OIT, or • High Pressure OIT	ASTM D3895 ASTM D5885	(11)	100 min. 400 min
Oven Aging at 85 C ⁽⁶⁾⁽⁷⁾ • Std OIT (min. avg.), % retained after 90 days, or • High Pressure OIT (min. avg.), % retained after 90 days	ASTM D5721 ASTM D3895 ASTM D5885	(11)	55% 80%
UV Resistance ⁽⁸⁾ • Std. OIT (min. avg.), or • High Pressure OIT (min. avg.) % retained after 1600 hrs ⁽¹⁰⁾	GRI GM -11 ASTM D3895 ASTM D5885	(11)	(9) 50%

- (1) Alternate the measurement side for double sided textured sheet
- (2) Machine direction (MD) and cross machine direction (XMD) average values shall be on the basis of 5 test specimens each direction.
 - Yield elongation is calculated using a gage length of 1.3 inches
 - Break elongation is calculated using a gage length of 2.0 inches.
- (3) The SP-NCTL test is not appropriate for testing geomembranes with textured or irregular rough surfaces. Test shall be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheet materials.
- (4) Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.
- (5) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
 - 9 in Categories 1 or 2, and
 - 1 in Category 3.
- (6) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
- (7) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
- (8) The condition of the test shall be 20 hr. UV cycle at 75 C followed by 4 hr. condensation at 60 C.
- (9) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
- (10) UV resistance is based on percent retained value regardless of the original HP-OIT value.
- (11) Manufacturer may provide certification letter per resin formulation.

TABLE 2
High Density Polyethylene (HDPE) Geomembrane 100 Mil Smooth

Properties	Test Method	Manufacturer QC Test Frequency	Required Test Values
Thickness (min. avg.) • Minimum individual	ASTM D5199	1 per Roll	100 mil 97 mil
Sheet Density (min)	ASTM D792 or ASTM D1505	1 per 50,000 ft ²	0.940 g/cc
Tensile Properties ⁽¹⁾ (min. avg.) • Yield strength • Break strength • Yield elongation • Break elongation	ASTM D6693	1 per 50,000 ft ²	210lb/in 380 lb/in 12% 700%
Tear Resistance (min. avg.)	ASTM D1004 Die C	1 per 50,000 ft ²	70 lbs
Puncture Resistance (min. avg.)	ASTM D4833	1 per 50,000 ft ²	180 lbs
Stress Crack Resistance ⁽²⁾	ASTM D5397 (App.)	(10)	300 hours
Carbon Black Content (range)	ASTM D1603	1 per 50,000 ft ²	2-3%
Carbon Black Dispersion ⁽⁴⁾	ASTM D5596	1 per 50,000 ft ²	Category 1,2, or 3 ⁽⁴⁾
Oxidative Induction Time (OIT) (min. avg.) ⁽⁵⁾ • Std. OIT, or • High Pressure OIT	ASTM D3895 ASTM D5885	(10)	100 min. 400 min.
Oven Aging at 85 C ⁽⁵⁾⁽⁶⁾ • Std OIT (min. avg.), % retained after 90 days or • High Pressure OIT (min. avg.), % retained after 90 days	ASTM D5721 ASTM D3895 ASTM D5885	 (10)	 55% 80%
UV Resistance ⁽⁷⁾ • Std. OIT (min. avg.), or • High Pressure OIT (min. avg.) % retained after 1600 hrs ⁽⁹⁾	GRIGM -11 ASTM D3895 ASTM D5885	 (10)	 (8) 50%

- (1) Machine direction (MD) and cross machine direction (XMD) average values shall be on the basis of 5 test specimens each direction.
 - Yield elongation is calculated using a gage length of 1.3 inches
 - Break elongation is calculated using a gage length of 2.0 inches.
- (2) The yield stress used to calculate the applied load for the SP_NCTL test shall be the manufacturer's mean value.
- (3) Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.
- (4) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
 - 9 in Categories 1 or 2, and
 - 1 in Category 3.
- (5) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
- (6) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
- (7) The condition of the test shall be 20 hr. UV cycle at 75 C followed by 4 hr. condensation at 60 C.
- (8) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
- (9) UV resistance is based on percent retained value regardless of the original HP-OIT value.
- (10) Manufacturer may provide certification letter per resin formulation.

**TABLE 3
REQUIRED SEAM PROPERTIES**

PROPERTY	QUALIFIER	UNIT	SPECIFIED VALUE ⁽¹⁾		TEST METHOD
<u>Physical Properties – Hot Wedge Seams</u>					
Thickness	Nominal	Mils	60	100	
Shear Strength ⁽²⁾⁽¹⁾ (at yield point)	Minimum	Lb/in width	120 FTB ⁽³⁾⁽²⁾	200 FTB	ASTM D6392
Peel Adhesion	Minimum	Lb/in width	91	151	ASTM D6392
			FTB	FTB	ASTM D6392
<u>Physical Properties – Extrusion Seams</u>					
Thickness	Nominal	Mils	60	100	
Shear Strength ⁽²⁾⁽¹⁾ (at yield point)	Minimum	Lb/in width	120 FTB ⁽³⁾⁽²⁾	200 FTB	ASTM D6392
Peel Adhesion ⁽⁴⁾	Minimum	Lb/in width	78 FTB	130 FTB	ASTM D6392

- (1) Destructive testing shall meet specified values for all testing. Values from GRIGM-19
(2) Also called "Bonded Seam Strength".
(3) FTB = Film Tear Bond (failure occurs through intact geomembrane, not through seam).
(4) No more than 25% of the seam width can separate (peel) to be considered a passing specimen.

**TABLE 4
REQUIRED GEOTEXTILE PROPERTIES**

PROPERTY	UNIT	VALUE ^(a)		MQC Test Frequency	TEST METHOD
		TYPE A	TYPE B		
Thickness	Mils	80	155	Every 50,000 ft ² Per Lot	ASTM D1777 or D5199
Mass/Unit Area	oz/yd ²	8	16	Every 50,000 ft ² Per Lot	ASTM D5261
Apparent Opening Size ^{(b)(c)}	U.S. Sieve	70 Max Opening 100 Min Opening		Every 50,000 ft ² Per Lot	ASTM D4751
Grab Strength	Lb	220	390	Every 50,000 ft ² Per Lot	ASTM D4632
Trapezoidal Tear Strength	Lb	95	150	Every 50,000 ft ² Per Lot	ASTM D4533
Puncture Strength	Lb	120	240	Every 50,000 ft ² Per Lot	ASTM D4833
Permittivity ^(e)	sec ⁻¹	1.5		Every 50,000 ft ² Per Lot	ASTM D4491
UV Resistance (500 hours)	% strength retained	>70	>70	Annually per each formulation ^(d)	ASTM D4355

Notes: (a) All values are minimum average roll values.

(b) Out-of-range values will be reviewed and can be approved by the CONTRACTOR on a case-by-case basis.

(c) Not Required for Cushion Geotextile (Type B)

(d) Manufacturer's annual UV testing on the material formulations for the products provided for the project.

**TABLE 5
REQUIRED GEONET PROPERTIES**

PROPERTY	QUALIFIER	GEONET		
		UNIT	VALUE	TEST
Mass per Unit Area	MARV ⁽¹⁾	oz/yd ⁽²⁾	24	ASTM D5261
Polymer specific gravity	Minimum	N/A	0.94	ASTM D1505
Polymer melt index	Range	g/10 min	0.1-1.1	ASTM D1238
Carbon black content	Range	%	2 - 3	ASTM D1603 or D4218
Thickness	MARV ⁽¹⁾	Mils	200 ⁽²⁾	ASTM D1777 or D5199

Notes:

- (1) MARV = Minimum Average Roll Value.
 (2) Represents minimum value, a thicker geonet may be required to meet transmissivity requirement of geocomposite.

**TABLE 6
REQUIRED GEOCOMPOSITE PROPERTIES**

TYPE A GEOCOMPOSITE				
PROPERTY	QUALIFIER	UNIT	VALUE	TEST
Transmissivity ⁽²⁾⁽³⁾	MARV ⁽¹⁾	m ² /sec	1 x 10 ⁻³	ASTM D4716
Ply Adhesion ⁽⁴⁾	Minimum	lb/in	1.0	ASTM D7005

Notes:

- (1) MARV = Minimum Average Roll Value.
- (2) Measured using water at 20°C (68°F) with a gradient of 0.1, under a compressive stress of 479 kPa (10,000 psf) between two smooth steel plates using a 15 minute seat time. Seat times greater than the 15 minute minimum specified in ASTM D4716 shall be approved by the CONTRACTOR prior to testing.
- (3) Certify there are no un-bonded areas for the geotextile to geonet, except for along panel edges.

CELL CONSTRUCTION – LEACHATE COLLECTION SYSTEMS AND LYSIMETERS CONTENTS

1.0	GENERAL.....	3
1.1	SUMMARY.....	3
1.2	ABBREVIATIONS.....	3
1.3	CODES, STANDARDS, LAWS, AND REGULATIONS.....	3
1.4	TECHNICAL SUBMITTALS.....	4
	1.4.1 Drainage Gravel Placement Plan.....	4
	1.4.2 Operations Layer Placement Plan.....	4
1.5	DESCRIPTION.....	5
	1.5.1 Drainage Gravel.....	5
	1.5.2 Operations Layer.....	5
2.0	MATERIALS AND EQUIPMENT.....	5
2.1	DRAINAGE GRAVEL.....	5
	2.1.1 Applicability.....	5
	2.1.2 Durability.....	5
	2.1.3 Permeability.....	5
	2.1.4 Samples.....	6
2.2	DRAINAGE GRAVEL TYPE A.....	6
2.3	DRAINAGE GRAVEL TYPE B.....	6
2.4	DRAINAGE GRAVEL TYPE C.....	7
2.5	OPERATIONS LAYER MATERIAL.....	7
	2.5.1 Composition.....	7
	2.5.2 Particle Size.....	7
	2.5.3 Compactability.....	7
	2.5.4 Samples.....	7
3.0	EXECUTION.....	8
3.1	GENERAL.....	8
	3.1.1 Unacceptable Materials and Work.....	8
3.2	MATERIALS IN CONTACT WITH GEOSYNTHETICS.....	8
	3.2.1 Temperature.....	8
	3.2.2 Minimum Thickness.....	8
	3.2.3 Hauling Equipment.....	8
	3.2.4 Spreading Equipment.....	9
	3.2.5 Spreading Operations.....	9
	3.2.6 Materials in Contact with Geocomposites.....	9
	3.2.7 CONTRACTOR Testing.....	9
3.3	DRAINAGE GRAVEL PLACEMENT PLAN.....	9
	3.3.1 Drainage Gravel Placement.....	9
	3.3.2 Compaction.....	10
	3.3.3 Protection.....	10
3.4	OPERATIONS LAYER PLACEMENT PLAN.....	11
	3.4.1 Operations Layer Placement.....	11
	3.4.2 Compaction.....	11
	3.4.3 Protection.....	11
3.5	CONSTRUCTION QUALITY CONTROL.....	12

CELL CONSTRUCTION – LEACHATE COLLECTION SYSTEMS AND LYSIMETERS

1.0 GENERAL

1.1 SUMMARY

This specification establishes requirements for the Leachate Collection System, Lysimeters, and Operation Layer of the Environmental Restoration Disposal Facility (ERDF) Cells 9 & 10.

1.2 ABBREVIATIONS

The abbreviations listed below, when used in this specification, have the following meaning:

API	American Petroleum Institute
ASTM	American Society for Testing and Materials
CQA	Construction Quality Assurance
CQC	Construction Quality Control
EPA	Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
HDPE	High Density Polyethylene
IWCP	Integrated Work Control Program
QAP	Quality Assurance Plan
SSRS	Subcontractor/Supplier Submittal Requirements Summary

1.3 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Leachate Collection System Construction. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Cell Construction. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM D422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2,700 kNm/m ³))
ASTM D2434	Standard Test Method for Permeability of Granular Soils (Constant Head)

ASTM D4373	Standard Test Method for Rapid Determination of Carbonate Content of Soils
ASTM D4644	Standard Test Method for Slake Durability of Shales and Similar Weak Rocks
ASTM D5321	Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method.
EPA/600/R-93/182	Quality Assurance and Quality Control for Waste Containment Facilities*
WAC 173 216	State Waste Discharge Permit Program
WAC 173 400	General Regulations for Air Pollution Sources

Washington DOT Standard Specification

* Note that an update to EPA/600/R-93/182 has been published: Daniel, D.E. and Koerner, R. M. (2007). *Waste Containment Facilities: Guidance for Construction Quality Assurance and Construction Quality Control of Liner and Cover Systems*, second ed., ASCE, New York, NY, 351 pp.

1.4 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.4.1 Drainage Gravel Placement Plan

The SUBCONTRACTOR shall submit a placement plan describing the proposed methods and equipment for drainage gravel manufacturing or supply; delivery; stockpiling; testing; placement; compaction; and as-built surveying. The plan shall include a quality control program for the SUBCONTRACTOR's activities related to the protection of adjacent pipes, geosynthetic layers and installation activities (inspections, measurements, materials, etc.). Ground contact pressures for the equipment used to place the gravel will also be included in the SUBCONTRACTOR's plan.

1.4.2 Operations Layer Placement Plan

The SUBCONTRACTOR shall submit a placement plan describing the proposed borrow source, methods, and equipment for operations layer placement, testing, compaction, and as-built surveying. The plan shall include a quality control program for the SUBCONTRACTOR's activities related to the protection of adjacent pipes, geosynthetic layers and installation activities (inspections, measurements, materials, etc.).

1.5 DESCRIPTION

This section includes the work for furnishing and installing the Drainage Gravel, and Operations Layer. The high density polyethylene (HDPE) pipe used as leachate collection piping on floor, cleanout access pipe on the slope, and sideslope sump riser pipes are included in specifications 0600X-SP-M0032 and 0600X-SP-M0033.

1.5.1 Drainage Gravel

This work consists of the supply and installation of gravel for the drainage layers and sumps in the ERDF cells.

1.5.2 Operations Layer

This work consists of the supply and installation of soil for the operations layer in the ERDF cells.

2.0 MATERIALS AND EQUIPMENT

Drainage gravel may be obtained from Pit 30 located north of the Construction Access Road approach on Route 3 as shown on Exhibit "F" drawings. Material from Pit 30 shall be excavated (existing stockpiles shall not be used) and processed to manufacture gravel meeting the specifications. SUBCONTRACTOR is responsible for traffic control and removal of mud, rocks, and debris across Route 3 during transport of gravel from Pit 30 to the project site.

2.1 DRAINAGE GRAVEL

2.1.1 Applicability

The following specifications apply to gravel in the primary and secondary leachate collection systems and the lysimeters.

2.1.2 Durability

Gravel shall consist of rounded material that is mechanically stable and chemically inert. In general, hard rock types such as basalt and granite are preferred; siltstones, mudstones, and carbonate rocks are not acceptable. The SUBCONTRACTOR shall perform carbonate content tests (ASTM D4373) on the gravel samples. A loss in weight of less than 3% will be considered acceptable.

2.1.3 Permeability

Gravel shall exhibit a permeability of 1×10^{-2} cm/sec or greater (ASTM D2434).

2.1.4 Samples

Submit gravel samples to the CONTRACTOR a minimum of two weeks prior to full scale production for testing in accordance with the CQA Plan.

2.2 DRAINAGE GRAVEL TYPE A

Type A gravel shall be used for drainage layers outside of the sump area. This material shall consist of rounded gravel meeting the following gradation requirements:

U.S. Sieve Size	% Passing
1-1/2 in.	100
1 in.	70-100
3/4 in.	60-100
3/8 in.	35-80
No. 4	10-40
No. 40	0-10
No. 100	0-4
No. 200	0-4

2.3 DRAINAGE GRAVEL TYPE B

Type B gravel shall be used for drainage inside of the primary and secondary sumps. This material shall consist of well-rounded gravel and meet the gradation requirements of Washington DOT standard specification 9-03.12(4) (ASTM C136)

U.S. Sieve Size	% Passing
1 in.	100
3/4 in.	80-100
3/8 in.	0-40
No. 4	0-4
No. 200	0-2

2.4 DRAINAGE GRAVEL TYPE C

Type C gravel shall be used for drainage inside of the lysimeter sump area. This material shall consist of crushed gravel meeting the following gradation requirements (ASTM C136):

U.S. Sieve Size	% Passing*
1-1/2 in.	100
1 in.	70-100
3/4 in.	60-100
3/8 in.	35-80
No. 4	20-60
No. 40	0-10
No. 100	0-4
No. 200	0-4

* Any deviations shall be approved by the CONTRACTOR prior to installation.

2.5 OPERATIONS LAYER MATERIAL

Operations layer material shall consist of native, non-organic, granular soil derived from approved on-site sources with following USCS classifications: GM, GP, SW, SM, and SP, or as approved by the CONTRACTOR.

2.5.1 Composition

Soils shall be free of roots, wood, peat, cinders, frozen material, rubbish, or other deleterious material.

2.5.2 Particle Size

Soils shall have a maximum particle size of 4 inches, provided large particles are in soil matrix (ASTM D422).

2.5.3 Compactability

Trench floor operations layer material shall be capable of being moisture conditioned and compacted to at least 90% of the maximum dry density as determined by the standard Proctor test (ASTM D698).

2.5.4 Samples

Submit samples a minimum of two weeks prior to full scale production for testing in accordance with the CQA Plan.

3.0 EXECUTION

3.1 GENERAL

3.1.1 Unacceptable Materials and Work

Materials and work that fail to meet the requirements of these specifications shall be removed and disposed of at the SUBCONTRACTOR's expense. Repair/replacement shall be at the SUBCONTRACTOR's expense.

3.2 MATERIALS IN CONTACT WITH GEOSYNTHETICS

Requirements of this section apply to geomembranes that are directly in contact with overlying soil or are covered with a layer of geotextile or geocomposite.

The requirements of this section are intended to assure that the installation of other materials does not damage the geomembrane. Additional requirements as established in the Subcontract are to assure that systems built with these other materials are constructed in such a way as to provide proper performance.

3.2.1 Temperature

Do not place granular materials on the geosynthetics at ambient temperatures below 32 degrees F or above 104 degrees F unless otherwise specified.

3.2.2 Minimum Thickness

Equipment used for placing granular material shall not be driven directly on the geosynthetics. A minimum thickness of 1 foot of granular material shall be maintained between placement equipment and the geosynthetics. A minimum thickness of 3 feet of granular material shall be maintained between rubber-tired hauling vehicles and the geosynthetics.

Equipment and minimum material thicknesses shall be closely monitored to verify that no loads exceed a ground contact pressure of more than 5 psi measured 12 inches above the geosynthetics. SUBCONTRACTOR shall submit equipment loading calculations demonstrating equipment loadings do not exceed 5 psi measured 12 inches above the geosynthetics.

The SUBCONTRACTOR shall survey the alignment and extents of access roads used to transport drainage gravel and operations layer materials over the liner system.

3.2.3 Hauling Equipment

No articulated trucks shall be used to haul granular material above the geosynthetics. Hauling operations above any geosynthetics shall be monitored to verify that appropriate material thicknesses are maintained.

3.2.4 Spreading Equipment

Equipment used for spreading material above any geosynthetics shall be a light ground pressure dozer with less than 5 psi contact pressure, or other equipment as approved.

3.2.5 Spreading Operations

Placement equipment operating on materials above geosynthetics shall not spin their wheels, make sharp turns, or make sharp, rapid stops. Good operating practice shall be used by spreading equipment. Specifically, no sharp turns, any abrupt starting or stopping, and no heavy loads using excavators. Materials shall be pushed carefully in an upward tumbling action from previously placed material and not dumped directly onto geosynthetics. Placement and spreading operations shall be continuously monitored by the SUBCONTRACTOR and the CONTRACTOR. The SUBCONTRACTOR will provide one spotter, or ground person, for each piece of equipment in operation. Since all geomembrane edges will be seamed, placement of soil materials on the geomembrane will not be allowed within 50 feet of any unseamed edge of geomembrane.

3.2.6 Materials in Contact with Geocomposites

The SUBCONTRACTOR shall place granular materials and HDPE riser pipes located on top of a geocomposite layer in such a manner as to ensure that the following conditions are satisfied:

- a. No damage to the geocomposite.
- b. No slippage of the geocomposite on underlying layers.
- c. No excess tensile stresses in the geocomposite.

3.2.7 CONTRACTOR Testing

After installation of the primary drainage aggregate layer is complete, the CONTRACTOR may perform testing in the access road areas to verify that the underlying liner system was not damaged during construction. The testing will take 2-3 weeks to complete and the primary drainage layer shall not be covered until directed by the CONTRACTOR.

3.3 DRAINAGE GRAVEL PLACEMENT PLAN

Submit a plan describing the manufacturing or supply, delivery, stockpiling, testing, placement, production, compaction, and as-built survey procedures for drainage gravel placement.

3.3.1 Drainage Gravel Placement

- a. Load, handle, and place drainage gravel using equipment and methods that will minimize generation of fines.

- b. Place gravel over lysimeter, secondary and primary geosynthetic materials across base of landfill, and in sumps as shown on Drawings.
- c. Spread gravel layers with low ground pressure spreading equipment as specified.
- d. Hauling and placing equipment shall operate on a minimum of 3 feet of granular material above any geosynthetic layer. Grading equipment shall operate on no less than 1 foot of gravel over any geosynthetic layer. In all cases, equipment and minimum material thicknesses shall be closely monitored to verify that no loads exceed a ground contact pressure of more than 5 psi measured 12 inches above the geosynthetics.
- e. The alignment of the leachate collection pipe shall be maintained until covered with drainage gravel.

3.3.2 Compaction

Drainage gravel shall be track walked in 1 foot thick lifts by spreading equipment. Type C crushed drainage gravel shall be compacted to 90 percent of the maximum dry density as determined by ASTM D698.

3.3.3 Protection

- a. Protect sump pipes, side slope riser pipes, perforated drain pipes, and other pipes and structures from damage.
- b. Do not use dozer or other vehicle to compact granular material within 1.5 feet of perforated drain or collector pipes. In these locations, compact with a walk-along vibratory roller, powertamper, or other means approved by CONTRACTOR after full thickness of granular material has been placed.
- c. Protect underlying geosynthetics from damage. Drainage gravel shall be pushed carefully from previously placed material and not dumped directly onto geosynthetics.
- d. The SUBCONTRACTOR shall take steps to minimize wrinkle generation in underlying geosynthetic materials during placement of the drainage gravel. The measures may include placing gravel in the early morning hours when the geosynthetic materials are cool and monitoring and walking out wrinkles in the geosynthetic materials that appear at the edge of the placement area.
- e. Do not place gravel over geomembrane or geosynthetics that have a "trampoline" effect due to low temperature shrinkage to prevent tearing seams. Allow liner material to warm and lay flat on substrate material before continuing spread of gravel layer.

3.4 OPERATIONS LAYER PLACEMENT PLAN

Submit a plan describing the manufacturing or supply, delivery, stockpiling, testing, placement, production, compaction, and as-built survey procedures for the operations layer.

3.4.1 Operations Layer Placement

- a. Place operations layer over geosynthetic materials on base and side slopes of landfill as shown on Drawings. Place and compact in one lift to minimize potential damage to the liner.
- b. Do not place operations layer until final inspection of geosynthetics by the CONTRACTOR has been made to verify that conditions stated in the CQA Plan are satisfied.
- c. Hauling and placing equipment shall operate on a minimum of 3 feet of operations material above any geosynthetic layer.
- d. Grading equipment shall operate on no less than 3 feet of material over any geosynthetic layer. In all cases, equipment and minimum material thicknesses shall be closely monitored to verify that no damage is done to the underlying liner system and no loads exceed a ground contact pressure of more than 5 psi measured 12 inches above the geosynthetics.
- e. Operations layer material placed on the side slopes shall be pushed up from the bottom of the slope.
- f. In locations where heat seaming has been used to join geotextile sections, the operations layer shall be spread in the same direction as the seam overlap to avoid placing additional stress on the seam.

3.4.2 Compaction

The finished surface of the operations layer on the trench floor shall be compacted to 90% of the maximum dry density as determined by the standard Proctor test (ASTM D698) and shall be capable of supporting rubber-tired vehicles with minimum degradation to the working surface.

3.4.3 Protection

- a. Protect underlying geosynthetics from damage.
- b. The SUBCONTRACTOR shall take steps to minimize wrinkle generation in underlying geosynthetic materials during placement of the operations layer. The measures may include placing operations layer material in the early morning hours when the geosynthetic materials are cool, and monitoring and walking out

wrinkles in the geosynthetic materials that appear at the edge of the placement area.

- c. Avoid placement of operations layer soils over any area of geomembrane with "trampoline" effect. Allow liner to warm and lay flat on substrate before continuing spreading operation.

3.5 CONSTRUCTION QUALITY CONTROL

Construction Quality Control and testing requirements are provided in Construction Quality Control Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the failing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

- (1) Control of overall drainage gravel layer thickness. Drainage gravel elevations shall be determined by the CQA Subcontractor's surveyor on a minimum 50 foot grid and at grade breaks over the floor and side slopes of the disposal trench except that detailed surveying shall be required in the sump area and other locations to establish grade breaks and slope continuity as directed by the CONTRACTOR. Vertical survey accuracy shall be plus or minus 0.05 feet or better. Results shall be provided to the CONTRACTOR. No liner materials shall be installed on the finished surface until satisfactory thickness of the drainage layer has been verified.
- (2) Control of overall operations layer thickness. Operations layer elevations shall be determined by the CQA Subcontractor's surveyor on a minimum 50 foot grid and at grade breaks over the floor and side slopes of the disposal trench except that detailed surveying shall be required in the sump area and other locations to establish grade breaks and slope continuity as directed by the CONTRACTOR. Vertical survey accuracy shall be plus or minus 0.05 feet or better. Results shall be provided to the CONTRACTOR.

Copies in duplicate of these surveys, records and other test results, as well as records of corrective actions taken to obtain satisfactory installations and satisfactory results, shall be furnished to the CONTRACTOR within one working day following the inspection, survey, or test.

LINED BOLTED STEEL LIQUID STORAGE TANK

CONTENTS

1.0	GENERAL.....	3
	1.1 SUMMARY.....	3
	1.2 ABBREVIATIONS	3
	1.3 REFERENCES	3
	1.4 QUALIFICATIONS	6
	1.5 SUBMITTALS	6
	1.5.1 Statements of Qualifications.....	6
	1.5.2 Tank Secondary and Primary Liners	6
	1.5.3 Drawings.....	7
	1.5.4 Calculations	7
	1.5.5 Design Assessment Report	7
	1.5.6 Tank Vendor Information	8
	1.5.7 Construction Quality Control	8
	1.6 DELIVERY AND STORAGE	9
	1.7 WARRANTY	9
2.0	PRODUCTS	10
	2.1 MANUFACTURER	10
	2.2 STANDARD PRODUCTS.....	10
	2.3 TANK SIZE REQUIREMENTS	10
	2.4 DESIGN.....	11
	2.4.1 Design Loads	11
	2.5 TANK COMPONENTS	11
	2.5.1 Corrugated Steel Wall Panels	11
	2.5.2 Concrete Tank Foundation	12
	2.5.3 Tank Secondary and Primary Liners	12
	2.5.4 Tank Level and Leak Detection Measurement	15
3.0	EXECUTION	15
	3.1 GENERAL.....	15
	3.2 TANK INSTALLATION.....	15
	3.3 CONSTRUCTION QUALITY CONTROL.....	15
	3.3.1 Tank System Installation Inspection.....	15
	3.3.2 Tank Liner Inspection.....	16
	3.3.3 Tank Tightness Testing.....	16

LINED BOLTED STEEL LIQUID STORAGE TANK

1.0 GENERAL

1.1 SUMMARY

This Specification sets the minimum standards for design and construction of a lined, bolted liquid storage tank. The tank shall be constructed from steel panels bolted together such that no field welding or onsite coating is required. The system shall provide an interior geosynthetic fabric to protect the factory fabricated membrane liner. A tank primary and secondary liner system shall be utilized.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

ASTM	American Society for Testing and Materials
ASCE	American Society of Civil Engineers
AWWA	American Water Works Association
LLDPE	Linear Low Density Polyethylene (LLDPE) Geomembrane
TCL	Top Capacity Level

1.3 REFERENCES

The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designations only.

ASCE Standard 7	Minimum Design Loads for Buildings and Other Structures
ASTM A653/A653M	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM D792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1004	Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
ASTM D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1603	Standard Test Method for Carbon Black Content in Olefin Plastics

ASTM D3786	Standard Test Method for Bursting Strength of Textile Fabrics - Diaphragm Bursting Strength Tester Method
ASTM D3895	Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D4355	Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon-Arc Type Apparatus
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D4833	Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
ASTM D5199	Standard Test Method for Measuring the Nominal Thickness of Geosynthetics
ASTM D5323	Standard Practice for Determination of 2% Secant Modulus for Polyethylene Geomembranes
ASTM D5596	Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D5617	Standard Test Method for Multi-Axial Tension Test for Geosynthetics
ASTM D5721	Standard Practice for Air-Oven Aging of Polyolefin Geomembranes
ASTM D5885	Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry
ASTM D6392	Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Method
ASTM D6693	Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes

AWWAD103	Factory-Coated Bolted Steel Tanks for Water Storage
AWWA D130	Flexible-Membrane Materials for Potable Water Applications
FS 5100	Preservation and Packing of Hand Tools; Tools and Tool Accessories for Power-Driven Metal Woodworking Machinery
GM11	Accelerated Weathering of Geomembranes Using a Fluorescent UVA Device
GM17	Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes
IBC	International Building Code

1.4 QUALIFICATIONS

Tank Manufacturer: At least five tanks presently in service, of similar size and character required for the Project, and minimum of 5 years satisfactory operation.

Tank Installer: Certified by tank manufacturer that installer is qualified to do the Work.

Registered Professional Engineer: Licensed in the state of Washington with training and expertise in tank system design and installation. Able to recognize signs of potential tank system failure during the intended operating life of the tank. Able to assess and interpret information on the waste to be stored in the tank and the waste compatibility with the materials used for the tank and piping system.

Installation Inspector: Knowledge of the physical sciences and the principals of engineering acquired by a professional education and related practical experience. Trained and experienced in the proper installation of tank systems or components. Certified by tank manufacturer that the inspector is qualified and experienced in type of Work to be performed.

1.5 SUBMITTALS

See Exhibit I, SUBMITTALS, for submittal procedures.

1.5.1 Statements of Qualifications

Tank manufacturer.

Tank installer.

Registered Professional Engineer.

Installation inspector.

1.5.2 Tank Secondary and Primary Liners

Manufacturer's Data: Manufacturer's descriptive data, specifications sheets, literature, and other data as necessary to fully demonstrate that those materials proposed for use comply with the requirements of these Specifications.

Installation Plan: Submit an installation plan for the liners and cover describing the proposed methods for liner and cover deployment, panel layout, seaming, repair, and protections. The plan shall also include a quality control program for the Construction General Contractor's activities related to liner and cover materials installation.

Factory Fabrication Inspection Data (Source Quality Control): Submit documentation of factory inspection as specified herein.

1.5.3 Drawings

Tank and Equipment: Detailed drawings for tank, anchor bolts and anchor bolt chains, and equipment, such as wall construction, pipe connections, cover, cover connection to tank, secondary containment system, and stilling wells for installation of level controls shall be stamped by the Registered Professional Engineer. Drawings shall include a complete list of equipment and materials, including manufacturer's descriptive and technical literature, and installation instructions.

1.5.4 Calculations

Stamped by the Registered Professional Engineer. Complete structural stress analysis of structural components and connections and anchorage system to the concrete ringwall foundation. Include anchor bolt reaction for all load cases and load combinations.

1.5.5 Design Assessment Report

A written report providing the results of the tank system design assessment prepared and certified by the Registered Professional Engineer attesting the tank has sufficient structural integrity and is acceptable for the storing and treating of dangerous waste.

The assessment report shall contain the following:

1. Site map of the facility showing the proposed location of the tank system within the overall facility.
2. A sketch of the tank system including connected piping and fittings.
3. Structural design standards and criteria used with reference to applicable industry standards and recommended practice codes. Include all calculations for tank, cover, concrete ringwall foundation, and anchoring. Tank shell shall be designed based on full tank. Design parameters used in calculations shall be clearly indicated and labeled on clarifying sketches. Seismic considerations that are appropriate to the seismic risk zone shall be accounted for in the calculations.
4. Description and assessment of the secondary containment system, results of primary liner and secondary liner leak detection surveys, and collection of releases into the secondary containment system; strength of secondary containment system to withstand stresses from static head during a release, climatic conditions, nearby vehicle traffic, and daily operations; description of the leak detection system that will detect the failure of the primary containment structure or the presence of any release of leachate or accumulated liquid in the secondary containment system within 24 hours; a description of the corrosion protection for the exterior surface of the tank.

5. Assessment of ancillary equipment as shown on the Drawings (piping, fittings, flanges, and valves) associated with the tank including support and protection against damage and excessive stress due to excessive settlement, vibration, expansion, or contraction. Verify that peak flows and internal stresses are within the design limits specified by the manufacturer of the ancillary equipment.
6. A statement by the Registered Professional Engineer certifying that the tank system has been adequately designed and that the tank system has sufficient structural strength to ensure that it will not collapse, rupture, or fail under the design conditions. The certification shall include the following statement:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations”.

The Registered Professional Engineer’s signature and stamp must be placed below the certification statement.

1.5.6 Tank Vendor Information

Installation: Tank Installation Instructions

O&M Manual: Submit operating and maintenance instructions prior to completion of the Project. The manual shall include the manufacturer’s cut sheets, parts lists, and a brief description of all equipment and their operating features. Maintenance instructions shall include all routine maintenance procedures, possible breakdowns and repairs, and trouble shooting guide, including recommended preventative maintenance tasks and frequencies for performance of those tasks.

Tank Materials: Submit manufacturer’s cut sheets, parts lists, and a brief description of all equipment and their operating features.

1.5.7 Construction Quality Control

Submit documentation of construction quality control as specified herein:

Installation Inspection Report: A written report prepared by the Installation Inspector or the Registered Professional Engineer documenting the results of the tank system installation inspection. The installation inspection report shall contain the following:

1. The as-built site plan showing the location of the installed tank system.
2. An as-built drawing of the installed tank system including connected piping and concrete ringwall foundation. Tank shall be clearly labeled with ID numbers.
3. Inspection notes, photographs, and any other material used to document inspection activities.
4. An assessment of the tank system for structural damage or inadequate construction/installation including weld breaks, punctures, damage to protective coatings, cracks, and corrosion, and documentation of any defects discovered in materials, equipment, or installation procedures and measurements taken to correct these defects.
5. Documentation of tightness testing results demonstrating the tank system is tight prior to placing it in service.
6. A statement certifying the proper installation of the tank system liner, signed by the liner installer's representative.
7. A signed and dated statement by the Installation Inspector or Registered Professional Engineer certifying the proper installation of the tank system. The certification shall include the following statement:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations”.

1.6 DELIVERY AND STORAGE

All materials and equipment delivered and placed in storage shall be stored with protection from the weather, excessive humidity, and excessive temperature variation; and dirt, dust, or other contaminants. The tank components shall be shipped in crate(s) or pallet(s) designed to prevent physical damage to the tank coating, linings, and structural components.

1.7 WARRANTY

The tank shall have a 1-year warranty from the date of Substantial Completion covering workmanship, materials, all steel components, and the liners and cover system. The warranty

shall provide for correction, or, at the option of the CONTRACTOR, removal and replacement of Work specified in this Specification section found defective during the period of the warranty.

The SUBCONTRACTOR shall provide the manufacturer's written warranty for the liners. The warranty shall be provided to the SUBCONTRACTOR as purchaser with the CONTRACTOR named as beneficiary and shall be signed by an authorized representative of the liner manufacturer. The warranty shall guaranty the liner material for the above-stated period against:

1. Manufacturing defects.
2. Deterioration due to ozone, ultraviolet, and other exposure to the elements, including the stored leachate.
3. Defects in material and factory seams.
4. Defects resulting from installation.

2.0 PRODUCTS

2.1 MANUFACTURER

Dimensions are based on bolted steel tank as manufactured by Environetics, Inc. All dimensions and clearances shall be taken as minimum if an "or equal" tank manufacturer is submitted and approved by the CONTRACTOR. SUBCONTRACTOR shall be responsible for all adjustments required to Drawings as a consequence of changing tank manufacturer.

2.2 STANDARD PRODUCTS

Materials and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of such products and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior the bid opening. Equipment shall be supported by a service organization that is, in the opinion of the CONTRACTOR, reasonably convenient to the site. The items specified under this section shall be furnished by constructors having experience and regular practice in the design, fabrication, and construction of steel tanks.

2.3 TANK SIZE REQUIREMENTS

Number of Tanks: One.

Diameter: 100 feet minimum.

Height: 8 feet minimum.

Cover Required: Yes, dome structure.

Leachate Volume: 430,000 gallons minimum.

Top Capacity Level (TCL): 7 feet minimum above tank floor.

2.4 DESIGN

Design shall be in accordance with the requirements of AWWA D103.

2.4.1 Design Loads

Specific Gravity: The tank shall be designed for liquids with a specific gravity of 1.00.

Earthquake: The tank shall be designed for Seismic Zone 2B per IBC and AWWA D103, site amplification soil profile C, $I=1.0$. For seismic, use leachate top capacity level (TCL).

Wind Force: The tank shall be designed to the greater requirements of a 100-mph wind with pressure loads as calculated with AWWA D103 or an 85-mph with pressure loads determined using ASCE Standard 7 (latest standard). Wind force calculations shall include wind analysis with an empty tank case as well as a full tank case.

Hydrostatic Pressure: Design tank for static pressure to top of tank shell height.

2.5 TANK COMPONENTS

The tank and liner system shall consist of the following components: steel wall panels with anchor embedded in concrete ringwall, geotextile base and wall buffer, secondary containment liner, drainage net, primary liner and dome structure cover, pipe connections, tank ladder, and piping for level and leak detection measurement. Plates and sheets used in the construction of the tank shall comply with the minimum standards of AWWA D103.

2.5.1 Steel Wall Panels

The tank walls shall be constructed from individual panels of corrugated, hot-dip galvanized or fusion bond coated steel, mill-rolled to finished diameter. Hot-dip sheet materials shall be ASTM A653/A653M, Grade D, or equal. Sheet materials shall be mill galvanized to ASTM A653/A653M, Class G90 standards, or equal. Shell plate thickness shall be based on AWWA D103 structural requirements. Wall plate thickness shall be a minimum of 12 gauge.

Sheet materials shall receive an electrostatically applied, thermally cured, polyester or a fusion bonded epoxy powder coat finish. The coating shall be applied in two coats with a minimum dry film thickness of 5.0 mils. The finished coating shall be white in color.

Anchor Bolts: Shall conform to the requirements of AWWA D103.

Bolted Joints: Structural bolts shall conform to the requirements of AWWA D103 and shall be zinc electroplated. Bolted joints shall utilize a minimum two vertical rows as required to withstand structural loads.

Geotextile Base and Wall Buffer: A 16-ounce geotextile polypropylene nonwoven needle-punched fabric shall be placed on the tank floor and wall as a buffer for the liner. The fabric shall be designed to protect the liner from irregular surfaces on the tank wall. The material properties shall conform with the following:

Fabric Property	Unit	Test Method	Value
Grab Tensile Strength	lb	ASTM D4632	425
Grab Elongation	%	ASTM D4632	50
Puncture Strength	lb	ASTM D4833	240
Mullen Burst	psi	ASTM D3786	800
Trapezoid Tear Strength	lb	ASTM D4533	150
Permittivity ^a	sec ⁻¹	ASTM D4491	.57
Water Flow Rate ^a	gpm/sq ft	ASTM D4491	45
AOS	sieve	ASTM D4751	100
UV Resistance	% strength @ 500 hrs	ASTM D4355	70

(a) Minimum average roll values (MARV) for these secondary physical properties shall not exceed specified values.

2.5.2 Concrete Tank Foundation

The tank foundation shall comply with the requirements of specification 0600X-SP-C0079 – Reinforced Concrete.

2.5.3 Tank Secondary and Primary Liners

The liners shall be fabricated from Linear Low Density Polyethylene (LLDPE) Geomembrane and conform to the following properties:

Linear Low Density Polyethylene (LLDPE) Geomembrane (SMOOTH)

Property	Test Method	Test Value	Manufacture Testing Frequency (minimum)
Thickness - mils (min. ave.) - lowest individual of 10 values	ASTM D 5199	30 min. 27 min.	per roll
Sheet Density, g/ml (max.)	ASTM D 1505/D 792	0.939	200,000 lb
Tensile Properties ⁽¹⁾ (min. ave.)	ASTM D 6693		200,000 lb

- Break Strength, lb/ in	Type IV	114	
- Break Elongation, %		800	
2% Modulus, lb/ in ² (max.)	ASTM D 5323	1800 (30 mil) 2400 (+40 mil)	per formulation
Tear Resistance, lb (min. ave.)	ASTM D 1004	16	45,000 lb
Puncture Resistance, lb (min. ave.)	ASTM D 4833	42	45,000 lb
Axi-Symmetric Break Resistance Strain % (min.)	ASTM D 5617	30	per formulation
Carbon Black Content ⁽²⁾ , %	ASTM D 1603	2.0 - 3.0	45,000 lb
Carbon Black Dispersion ⁽³⁾	ASTM D 5596	- Note 3 -	45,000 lb
Oxidate Induction Time (OIT) (min. ave.) ⁽⁴⁾			200,000 lb
(a) Standard OIT	ASTM D 3895	100	
-- or --			
(b) High Pressure OIT	ASTM D 5885	400	
Oven Aging at 85°C ⁽⁵⁾	ASTM D 5721		per formulation
(a) Standard OIT (min. ave.)	ASTM D 3895	35	
- % retained after 90 days			
-- or --			
(b) High Pressure OIT (min. ave.)	ASTM D 5885	60	
- % retained after 90 days			
UV Resistance ⁽⁶⁾	GRI GM11		per formulation
(a) Standard OIT (min. ave.)	ASTM D 3895	N.R. ⁽⁷⁾	
-- or --			
(b) High Pressure OIT (min. ave.)	ASTM D 5885	35	
- % retained after 1600 hrs ⁽⁸⁾			
Seam Properties	ASTM D 6392 (@ 2 in/min)		
1. Shear Strength, lb/ in		45	45
2. Peel Strength, lb/ in - Hot Wedge		38	38
3. Peel Strength, lb/ in - Extrusion Fillet		34	34

- (1) Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction. Break elongation is calculated using a gauge length of 2.0 inches at 2.0 in./min.
- (2) Other methods such as ASTM D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.
- (3) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
9 in Categories 1 and 2 with 1 in category 3.
- (4) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
- (5) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
- (6) The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation 60°C.
- (7) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
- (8) UV resistance is based on percent retained value regardless of the original HP-OIT value.

Tank Liner Source Quality Control: The tank liner(s) shall be fabricated from standard width sheeting into a full-size fitted liner. The liner(s) shall be thoroughly inspected by the fabricator for flaws in materials or fabrication prior to shipment. Inspection shall be performed by 100 percent visual inspection. Construction General Contractor shall provide documentation of inspections to the CONTRACTOR.

Pipe Penetrations through Floor Liners: Shall utilize fabricated HDPE flatstock and HDPE pipe. Floor penetrations shall not be geomembrane pipe boots.

Dome Structure Cover: The cover shall be a dome structure shall be a water-tight, clear-span, self-supporting from the periphery structure designed to comply with the design requirements specified in Section 2.4. The cover shall be designed and constructed to allow for thermal expansion.

Drainage Net: The floor area of the tank shall be covered with fitted panels of high density polyethylene (HDPE) drainage net with a geotextile laminated to both sides of the drainage net to prevent clogging and to provide a cushion for the HDPE drainage net against the tank liners. The drainage net shall be installed between the primary and secondary liners to convey liquids between the liners to a leak detection sump. Properties for the drainage net and geotextile are as follows:

Physical Properties		Test Method	Physical Value
Combined	Transmissivity, m/sec	ASTM D4716	4×10^{-5} min.
Drainage Net Component	Transmissivity, m/sec	ASTM D4716	1×10^{-3} min.
	Thickness, mil	ASTM D1777	200
	Density g/cm ³	ASTM D1505	0.94
	Tensile Strength, lb/in	ASTM D5034/5035	45
	Carbon Black Content, %	ASTM D1603	2.0
Geotextile Component	Thickness, mil	ASTM D5199	90
	Grab Tensile, lb	ASTM D4632	210
	Puncture Strength, lb	ASTM D4833	135 ± 5 lbs
	AOS, US Sieve	ASTM D4751	80
	Flow Rate, gpm/ft	ASTM D4491	110 ± 10 gpm/ft
	UV Resistance, % retained	ASTM D4355	70

Pipe Connections: Pipe fittings and connections shall be in accordance with manufacturer's requirements for double containment connections. Location of pipe connections shall be as shown on the Drawings.

Tank Ladder: Provide a hot-dipped galvanized steel ladder for access to the cover access hatch. The ladder shall be attached at the top of the tank wall and at its base to the concrete ringwall. The ladder shall be of sufficient height to allow access to the cover access hatch. The ladder shall be located adjacent to the tank level element installation.

Foundation: Tank shell to bear on a Type 1 concrete ringwall per AWWA D103 as shown on the Drawings. A 1-1/2-inch minimum space between the tank bottom and the top of the ringwall shall be filled with a nonshrink grout as specified in 0600X-SP-C0079 – Reinforced Concrete. Cane fiber joint filler shall not be used. Ringwall design is shown on the Drawings.

2.5.4 Tank Level and Leak Detection Measurement

Provide as part of tank construction two 2-inch diameter (Schedule 80 PVC) internal (stilling wells) that extend the whole interior operating height of tank, for the purpose of facilitating the installation of a submersible pressure transmitter (in one pipe).

SUBCONTRACTOR shall furnish and install all necessary equipment and personnel to properly support installation of measurement devices (i.e., PVC flanges, straps, and gaskets).

3.0 EXECUTION

3.1 GENERAL

Tank construction shall be in accordance with AWWA D103.

3.2 TANK INSTALLATION

Field erection of a lined bolted steel tank, including, but not limited to, shell plates, pipe connections, awning, primary and secondary containment, and cover shall be in strict accordance with the manufacturer's recommendations including their guidance on environmental factors that could affect the tank installation. The geomembrane liners shall be tested and installed in accordance with Specification No. 0600X-SP-C0077.

3.3 CONSTRUCTION QUALITY CONTROL

The SUBCONTRACTOR shall establish and maintain a quality control system to assure compliance with contract requirements and shall maintain records of its quality control for all operations including, but not limited to the following:

1. Inspection of materials delivered to project site against approved material data.
2. Storage and handling of materials.
3. Finished appearance.
4. Completion of required testing.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be furnished to the CONTRACTOR with 24 hours following the inspection or test.

3.3.1 Tank System Installation Inspection

The SUBCONTRACTOR shall provide the services of an Installation Inspector or Registered Professional Engineer to provide full-time supervision of the installation of the storage tank. No

work shall be performed without the presence in the field of the Installation Inspector or Registered Professional Engineer. The Installation Inspector or Registered Professional Engineer shall observe and verify that correct materials and procedures are used for the following activities:

1. Visual inspection and testing.
2. Subgrade and foundation preparation.
3. Placement and compaction of backfill.
4. Placement of reinforcing steel and anchor bolts.
5. Concrete Placement.
6. Placement of shop-fabricated tank parts
7. Erection of field-erection tank parts.
8. Installation of tank liner systems. Tank liner inspection requirements are specified herein.
9. Installation of piping, pumping, and other ancillary equipment.
10. Tightness testing.

3.3.2 Tank Liner Inspection

Visual Inspection: 100 percent visual inspection along all seams, panels, and penetrations of the liners. |

The geomembrane shall be installed in accordance with Specification No. 0600X-SP-C0077. |

Any required repairs shall be corrected in accordance with the manufacturer's recommendations. Results of all testing shall be provided to the CONTRACTOR.

Electronic Leak Location Survey: Prior to installing the cover, complete an electronic leak location survey of the secondary and primary liners.

3.3.3 Tank Tightness Testing

Upon completion of tank installation, the tank shall be visually inspected for any signs of physical damage. Any questionable areas shall be repaired in accordance with the manufacturer's instructions. The tank shall be filled with water and let stand for a period of not less than 2 days. The SUBCONTRACTOR shall maintain a level not less than 7 feet for the duration of 2 days. Following the 2 days, the SUBCONTRACTOR shall cyclically change the |

tank water level at a constant rate from 0.5 foot to 7 feet for four cycles over the next 28 days. During the 30 days, there shall be no signs of leakage from a defect in the primary liner to the secondary containment system of the tank. Any leaks discovered by this test shall be corrected by the SUBCONTRACTOR in accordance with the manufacturer's recommendations. The tank system shall be successfully tested before it is accepted. Results of all testing shall be provided to the CONTRACTOR.

The water used for the testing shall be discharged into the storm water control area located approximately 400 feet east of the leachate tanks. The discharge rate shall not exceed 150 gallons per minute, 150,000 gallons per day, and shall not spill over the spillway. The SUBCONTRACTOR shall not discharge without prior approval from the CONTRACTOR. SUBCONTRACTOR shall record and submit discharge rates, quantities, and dates to the CONTRACTOR.

PIPE, VALVES, AND SPECIALS

CONTENTS

1.0	GENERAL.....	4
	1.1 SUMMARY.....	4
	1.2 ABBREVIATIONS	4
	1.3 REFERENCES	4
	1.4 CODES, STANDARDS, LAWS, AND REGULATIONS	5
	1.5 TECHNICAL SUBMITTALS.....	9
	1.5.1 Manufacturer's Information	9
	1.5.2 Installation Instructions	9
	1.5.3 Statement of Satisfactory Installation.....	9
	1.6 GENERAL REQUIREMENTS.....	9
	1.7 DELIVERY, STORAGE AND HANDLING	10
2.0	MATERIALS AND EQUIPMENT.....	10
	2.1 POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS.....	10
	2.2 PLASTIC MARKING TAPE.....	11
	2.3 HDPE PIPE.....	12
	2.3.1 Resin	12
	2.3.2 Quality	12
	2.3.3 Form.....	12
	2.3.4 Manufacturer's QC Certificates	13
	2.4 HDPE DOUBLE CONTAINMENT PIPE	13
	2.4.1 Pipe Materials	13
	2.4.2 Configuration.....	13
	2.4.3 Support Spacers	13
	2.4.4 End Seals	13
	2.4.5 HDPE Fittings.....	14
	2.5 HDPE COUPLINGS AND END CAPS.....	14
	2.5.1 Couplings.....	14
	2.5.2 Flanged Connections	14
	2.5.3 End Caps.....	14
	2.6 PERFORATIONS AND PENETRATIONS	14
	2.6.1 Leachate Collection Piping.....	14
	2.6.2 Sump Pipes	14
	2.7 HDPE FLATSTOCK.....	15
	2.7.1 Resin	15
	2.7.2 Material Properties.....	15
	2.7.3 Thickness	15
	2.8 BOOTS	15
	2.9 HDPE PIPE SCHEDULE.....	15
	2.10 VALVES.....	16
	2.10.1 Gate Valves.....	16
	2.10.2 Ball Check Valves	16
	2.10.3 Ball Valves.....	16

	2.10.4	Valve Schedule (Each Crest Pad Building)	16
	2.10.5	Motor Actuated Plug Valves	17
2.11		FLOW METERS	19
	2.11.1	Paddle Meters	19
2.12		MANHOLES	20
2.13		NOT USED	20
2.14		MISCELLANEOUS ITEMS	20
	2.14.1	Valve Nameplates	20
	2.14.2	Service Clamps	20
	2.14.3	Pipe Supports	20
3.0		EXECUTION	20
3.1		IDENTIFICATION OF PIPING	20
	3.1.1	Labels	21
	3.1.2	Lettering	21
3.2		IDENTIFICATION OF VALVES AND SHORT PIPE LENGTHS	21
	3.2.1	General	21
	3.2.2	Tags	21
3.3		PIPE INSTALLATION	21
	3.3.1	Cutting of Pipe	21
	3.3.2	Joint Deflection	21
	3.3.3	Placing and Laying	22
	3.3.4	Connections	22
	3.3.5	Penetrations	22
	3.3.6	Flanged Pipe	22
	3.3.7	Jointing	23
	3.3.8	Crest Pad Valves and Drain Lines	23
	3.3.9	Pipe Supports	23
3.4		HDPE PIPE INSTALLATION	23
3.5		ACCEPTANCE TESTING	25
	3.5.1	General	26
	3.5.2	Buried Pipe Testing	27
	3.5.3	Raw Water Pipe	27
3.6		CLEANING	28
3.7		QUALITY ASSURANCE/QUALITY CONTROL	28

PIPING, VALVES, AND SPECIALS

1.0 GENERAL

1.1 SUMMARY

This specification establishes quality and workmanship requirements and defines how quality is measured for the Piping, Valves, and Specials.

1.2 ABBREVIATIONS

The abbreviations listed below, as used in this specification, shall have the following meaning:

API	American Petroleum Institute
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
CFR	Code of Federal Regulations
ERDF	Environmental Restoration Disposal Facility
GSA	U.S. General Services Administration
HDPE	High Density Polyethylene
MSS	Manufacturers Standardization Society of the Valves and Fittings Industry
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PVC	Polyvinyl Chloride
psi	Pounds per Square Inch
QA/QC	Quality Assurance/Quality Control
QAP	Quality Assurance Program
SDR	Standard Dimension Ratio
SSRS	Subcontractor/Supplier Submittal Requirements Summary
VARV	Vacuum/Air Release Valve
VRV	Vacuum Release Valve

1.3 REFERENCES

29 CFR 1910	Occupational Safety and Health Standards
49 CFR 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
49 CFR 192.285	Plastic pipe: Qualifying persons to make joints.
ANSI/ASME	Applicable B31 Standards

1.4 CODES, STANDARDS, LAWS, AND REGULATIONS

Unless otherwise approved or shown, the following Codes, Standards, Laws, and Regulations of the latest issue, at the time of bid, shall apply to establish the minimum requirements for Piping, Valves, and Specials. Referenced test methods, specifications, and recommended practices are to be used to verify material properties and to identify acceptable practices applicable to Piping, Valves, and Specials. Failure to identify applicable codes and standards does not imply elimination of required knowledge and compliance to perform work.

49 CFR 192.285	Plastic pipe: Qualifying persons to make joints
ASME B1.20.1	Pipe Threads, General Purpose (Inch)
ASME B16	Standards of Pipes and Fittings
ASME B16.1	Cast iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250
ASME B16.3	Malleable Iron Threaded Fittings
ASME B16.34	Valves-Flanged, Threaded, and Welding End
ASME B16.5	Pipe Flanges and Flanged Fittings
ASME B31.1	Power Piping
ASME B31.3	Process Piping
ASME B31.9	Building Services Piping
ASME B36.10M	Welded and Seamless Wrought Steel Pipe
ASME B36.19M	Stainless Steel Pipe
ASTM A53/A53M	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A193/A193M	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications

ASTM A194/A194M	Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A276	Standard Specification for Stainless Steel Bars and Shapes
ASTM A312/A312M	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Pipes
ASTM A351/A351M	Standard Specification for Castings, Austenitic, for Pressure-Containing Parts
ASTM A403/A403M	Standard Specification for Wrought Austenitic Stainless Steel Pipe Fittings
ASTM A743/A743M	Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application
ASTM A744/A744M	Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service
ASTM A813/A813M	Standard Specification for Single- or Double-Welded Austenitic Stainless Steel Pipe
ASTM A814/A814M	Standard Specification for Cold-Worked Welded Austenitic Stainless Steel Pipe
ASTM A815/A815M	Standard Specification for Wrought Ferritic, Ferritic/Austenitic, and Martensitic Stainless Steel Piping Fittings
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM D792	Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1248	Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
ASTM D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D1784	Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds

ASTM D1785	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2000	Standard Specification for Rubber Products in Automotive Applications
ASTM D2241	Standard Specification for Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
ASTM D2464	Standard Specification for Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2466	Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 40
ASTM D2467	Standard Specification for Socket-Type Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80
ASTM D2513	Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
ASTM D2564	Standard Specification for Solvent Cements for Polyvinyl Chloride (PVC) Plastic Piping Systems
ASTM D2657	Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings
ASTM D2683	Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
ASTM D2855	Standard Practice for Making Solvent-Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings
ASTM D3350	Standard Specification for Polyethylene Plastics Pipe and Fitting Materials
ASTM F593	Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F1476	Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications
ASTM F2620	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
AWWA C104/A21.4	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

AWWA C105/A21.5	Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110/A21.10	Ductile-Iron and Gray-Iron Fittings for Water
AWWA C111/A21.11	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115/A21.15	Flanged Ductile-Iron Pipe with Threaded Flanges
AWWA C151/A21.51	Ductile-Iron Pipe, Centrifugally Cast
AWWA C153/A21.53	Ductile-Iron Compact Fittings for Water Service
AWWA C207	Steel Pipe Flanges for Waterworks Service Sizes 4 In. Through 144 In. (100 mm through 3,600 mm)
AWWA C208	Dimensions for Fabricated Steel Water Pipe Fittings
AWWA C500	Metal-Seated Gate Valves for Water Supply Services
AWWA C502	Dry-Barrel Fire Hydrants
AWWA C504	Rubber-Sealed Butterfly Valves
AWWA C509	Resilient-Seated Gate Valves for Water Supply Service
AWWA C511	Reduced-Pressure Principle Backflow-Prevention Assembly
AWWA C600	Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances
AWWA C606	Grooved and Shouldered Joints
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In Through 12 In (100 mm through 300 mm), for Water Transmission and Distribution
AWWA M23	PVC Pipe - Design and Installation
GSA FS RR-W-410	Wire Rope and Strand
MSS SP-58	Pipe Hangers and Supports – Materials, Design and Manufacture
MSS SP-69	Pipe Hangers and Supports – Selection and Application
MSS SP-80	Bronze Gate, Globe, Angle and Check Valves

NFPA 24	Standard for the Installation of Private Fire Service Mains and their Appurtenances
NFPA 49	Hazardous Chemicals Data
NFPA 325M	Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids
NFPA 704	Standard System for the Identification of the Hazards of Materials for Emergency Response

1.5 TECHNICAL SUBMITTALS

Submittals stated herein or elsewhere in the specification shall be submitted for review and approval in accordance with Exhibit "I", Subcontractor/Supplier Submittal Requirements Summary (SSRS). Submittals that do not meet the requirements will be rejected. Rejected submittals shall be resubmitted to avoid delays.

1.5.1 Manufacturer's Information

Printed copies of the manufacturer's literature stating materials of construction, applicable standards, capacities, rated pressures, and other product information indicate compliance with the project specifications.

1.5.2 Installation Instructions

The manufacturer's recommendations for each material or procedure will be utilized.

1.5.3 Statement of Satisfactory Installation

A statement signed by the SUBCONTRACTOR's principal officer stating that the installation is satisfactory and in accordance with the Subcontract plans, drawings, codes, standards, and specifications and the manufacturer's prescribed procedures and techniques, upon completion of the project and before final acceptance.

1.6 GENERAL REQUIREMENTS

This specification covers the procurement, installation, and testing of the leachate, and raw water (if used) systems. The SUBCONTRACTOR shall have a copy of the manufacturer's instructions available at the construction site and shall follow those instructions unless directed otherwise by the CONTRACTOR. Pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material before, during, and after installation. Backfilling shall be accomplished after inspection by the CONTRACTOR and others. The SUBCONTRACTOR shall replace damaged materials and redo unacceptable work at no additional cost to the CONTRACTOR.

1.7 DELIVERY, STORAGE AND HANDLING

Materials and equipment shall be handled so as to insure delivery to the site in sound, undamaged condition. Materials and equipment shall be stored with protection from weather, humidity and temperature variations, dirt and dust, or other contaminants, in accordance with code and standard requirements and manufacturer's recommendations. Proper protection and care of materials before, during, and after installation shall be the SUBCONTRACTOR's responsibility. Any materials found to be damaged or unacceptable shall be repaired or replaced at SUBCONTRACTOR's expense. During storage and installation, piping and similar openings shall be capped to keep out dirt and other foreign matter.

2.0 MATERIALS AND EQUIPMENT

2.1 POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS

- a) Pipe 4-inch through 12-inch diameter shall conform to AWWA C900, Class 200, CIOD pipe dimensions, elastomeric-gasket joint, unless otherwise shown or specified.
 - 1) For pipe 4-inch diameter and larger: Fittings and specials shall be ductile iron, bell end in accordance with AWWA C110, 350 psi pressure rating unless otherwise shown or specified, except that profile of bell may have special dimensions as required by the pipe manufacturer. Fittings and specials constructed of the same material as the pipe shall be fitted with elastomeric gaskets in conformance with AWWA C900. Iron fittings and specials shall be cement-mortar lined (standard thickness) in accordance with AWWA C104. Fittings shall be bell and spigot or plain end pipe, or as applicable. Ductile iron compact fittings shall be in accordance with AWWA C153. (Specials: special ductile iron pipe fittings to meet out-of-the-ordinary construction requirements, including welded outlets, wall sleeves, thrust collar/water stops, saddle outlets, castings, bell-less ductile iron pipe for trenchless installation, and fittings with unique combinations of joints.)
- b) Pipe Less Than 4-inch Diameter:
 - 1) Pipe

Schedule 80 PVC: Type I, Grade I or Class 12454-B conforming to ASTM D1784 and ASTM D1785. Pipe shall be manufactured with 1.5 percent titanium dioxide for ultraviolet protection.
Threaded Nipples: Schedule 80 PVC.
 - 2) Fittings

Schedule to Match Pipe: ASTM D2466 and ASTM D2467 for socket-weld type and Schedule 80
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ASTM D2464 for threaded type. Fittings shall be manufactured with 1.5 percent titanium dioxide for ultraviolet protection.

- 3) Joints Solvent socket-weld except where connection to threaded valves and equipment that require disassembly.
- 4) Flanges One piece, molded hub type PVC flat face flange in accordance with Fittings above, 125-pound ANSI B16.1
- 5) Bolting ASTM A193/A193M Type 316 stainless steel Grade B8M hex head bolts and ASTM A194/ A194M Grade 8M hex head nuts.
- 6) Gaskets
Flat Face Mating Flange: Full faced 1/8-inch thick ethylene propylene (EPR) rubber.

Raised Face Mating Flange: Flat ring 1/8-inch ethylene propylene (EPR) rubber, with filler gasket between OD of raised face and flange OD to protect the flange from bolting moment.
- 7) Solvent Cement and primer as recommended by the pipe and fitting manufacturer conforming to ASTM D2564.
- 8) Thread Lubricant Teflon Tape.

2.2 PLASTIC MARKING TAPE

Plastic marking tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in TABLE 1 and shall bear a continuous printed inscription describing the specific utility. Tape shall be a minimum of 3-inch width.

Table 1. Tape Color	
Red:	Electric
Blue:	Water Systems
Yellow/Magenta	Leachate

2.3 HDPE PIPE

This section includes High Density Polyethylene (HDPE) Pipe used in the ERDF landfill including but not limited to:

1. Leachate collection piping on floor and cleanout access pipes on the slopes of the trench.
2. Side slope riser pipes containing submersible sump pumps and level transducers.
3. Sump pump discharge piping.
4. Prefabricated HDPE boots to be placed around all pipe penetrations through the HDPE liner.
5. Double containment piping from Crest Pad Buildings to manholes as shown on the Drawings.
6. Lysimeter pipes.

HDPE pipe shall meet or exceed the requirements of ASTM D3350-08 high-density polyethylene, minimum cell classification values of 345434C. Alternate cell classifications are acceptable if one or more of the six numbers in the cell classification is greater than the minimum.

Pipe joints, fittings and flanged connections shall be joined by thermal butt-fusion or electrofusion.

2.3.1 Resin

Polyethylene resins shall conform to Type PE 3408, PE3608, or CONTRACTOR approved alternate.

Protection shall be provided against ultraviolet light degradation using carbon black, not less than 2 percent well dispersed in the resin.

2.3.2 Quality

The pipe shall have uniform wall thickness and shall be uniform in color, opacity, density, and other physical properties. Pipe shall be homogeneous throughout and free of visible cracks, holes, blisters, bubbles, undispersed raw materials, or any contamination by foreign matter. Any pipe with nicks, scrapes, or gouges deeper than 25 percent of the nominal wall thickness shall be rejected.

2.3.3 Form

Pipe may be supplied in a continuous extruded seamless piece or in sections.

2.3.4 Manufacturer's QC Certificates

Prior to shipment, the HDPE pipe Manufacturer shall submit a quality control certificate for each lot/batch of HDPE pipe provided. A responsible party employed by the HDPE pipe Manufacturer, such as the Production Manager shall sign the quality control certificate. The quality control certificate shall include both:

- a) Lot/batch numbers and identification.
- b) Sampling procedures and results of quality control tests.

2.4 HDPE DOUBLE CONTAINMENT PIPE

2.4.1 Pipe Materials

Both carrier pipe and containment pipe shall meet the requirements of HDPE Pipe of this section.

2.4.2 Configuration

Double containment pipe shall consist of factory pre-fabricated components, with a carrier pipe installed within a containment pipe. Pipe and fittings shall provide a continuous annular space between the carrier and containment pipes to accommodate monitoring systems and flow of fluid from the carrier pipe leakage.

2.4.3 Support Spacers

Carrier pipe support spacers shall be HDPE sheet stock ½-inch thick minimum. The support spacing shall be per pipe manufacturer's recommendations and as approved by the CONTRACTOR. The spacers shall maintain the specified annulus between the carrier and containment pipes and shall allow for unrestricted passage of monitoring systems and possible flow of fluid from the carrier pipe. SUBCONTRACTOR is to provide an assembled sample of carrier pipe, spacers, and containment piping the SUBCONTRACTOR is planning to utilize, for CONTRACTOR inspection and approval, prior to ordering the material.

2.4.4 End Seals

Expansion type end seals or fixed end caps shall be used to seal the annulus between the carrier and containment pipes. End seals shall include side ports for monitoring systems or to drain fluid from the annulus. End seals shall be factory manufactured.

2.4.5 HDPE Fittings

Fittings shall conform to the requirements of HDPE Pipe of this section and shall be compatible with the other components of the double containment system. Fittings shall be pre-fabricated with the carrier fitting installed within the containment fitting and containment pipe support spacers installed.

2.5 HDPE COUPLINGS AND END CAPS

2.5.1 Couplings

Couplings for socket fusion shall satisfy the specifications for HDPE Pipe, except that other cell classifications are acceptable provided that they are compatible with the HDPE pipe and provide equivalent performance to class 345434C. Couplings shall satisfy the requirements of ASTM D2513 and shall be manufactured in compliance with ASTM D2683.

2.5.2 Flanged Connections

Where pipes or fittings of different materials are connected, the coupling shall be a flanged connection. The flanges shall be ANSI 150-pound class flanges. The flange joints shall use stainless steel nuts, washers, and bolts. Gaskets shall be utilized when joining to nonpolyethylene materials.

2.5.3 End Caps

Provide molded polyethylene end caps for ends of cleanout access pipes. Caps shall prevent entry of soil or debris into the cleanout pipe and shall be removable. Composition of polyethylene shall be compatible with cleanout pipes per manufacturer's recommendations and shall withstand outdoor conditions.

2.6 PERFORATIONS AND PENETRATIONS

2.6.1 Leachate Collection Piping

Leachate collection piping on the floor of the landfill shall be perforated. Perforations shall be as shown on the drawings.

2.6.2 Sump Pipes

The sump pipes (lower portion of the side slope riser pipes within the sump gravel) shall be perforated as shown on the drawings.

2.7 HDPE FLATSTOCK

2.7.1 Resin

Flatstock shall meet or exceed ASTM D3350-08, minimum cell classification values of 3454310. Alternate cell classifications are acceptable if one or more of the six numbers in the cell classification is greater than the minimum.

2.7.2 Material Properties

The flatstock shall meet the requirements for specific gravity, carbon black content, and melt index as specified for HDPE Pipe.

2.7.3 Thickness

The flatstock used in the primary sump shall have a nominal thickness of 1 inch. The edges of the flatstock shall have a 0.25 inch bevel.

2.8 BOOTS

The SUBCONTRACTOR shall supply prefabricated HDPE boots conforming to the requirements for geomembrane for miscellaneous applications presented in the Technical Specifications for Cell Construction for penetrations of HDPE pipe through the geomembrane liner (i.e., 0600X-SP-C0077, "Geosynthetics", and 0600X-SP-C0078, "Leachate Collection").

2.9 HDPE PIPE SCHEDULE

HDPE pipe nominal diameter and wall thickness shall be as follows:

Submersible pump discharge piping	1 ½ inch diameter, SDR 11 (non-coiled)
Submersible pump discharge piping	3 inch diameter, SDR 11
Sump level transducer access pipe	Primary: 6 inch diameter, SDR 11 Secondary: 12 inch diameter, SDR 11
Sump/Slope riser pipe	12 inch diameter, SDR 11
Sump/Slope riser pipe	18 inch diameter, SDR 13.5
Double containment pipe 2/6	2 inch diameter, SDR 11 6 inch diameter, SDR 17
Double containment pipe 4/8	4 inch diameter, SDR 11 8 inch diameter, SDR 17

Double containment pipe 10/16	10 inch diameter, SDR 11 16 inch diameter, SDR 17
Perforated leachate pipe	12 inch diameter, SDR 11
Lysimeter Access Pipe (perforated and solid walled)	8 inch diameter, SDR 11

2.10 VALVES

2.10.1 Gate Valves

Gate valves shall be designed for a working pressure of not less than 200 psi. Valve connections (the connection shall allow for replacement/removal of the valve) shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. An arrow and either the word "open" or "close" shall be cast or permanently affixed on the handwheel to indicate the appropriate direction to turn the handwheel.

- a. Valves 3 inch and larger shall be iron body resilient seat, wedge type, bronze mounted, non-rising stem and shall conform to AWWA C509.

2.10.2 Ball Check Valves

Furnish and install check valves sized as shown on the Drawings. Type I, Grade I polyvinyl chloride body, single or dual union socket weld ends, rated 150 psi at 120 degrees F.

Ball check valves shall be Plast-O-Matic CKS 150VS-NC-PV or CONTRACTOR approved alternate.

2.10.3 Ball Valves

Furnish and install ball valves sized as shown on the Drawings. Rated 150 psi with ASTM D1784, Type I, Grade 1 polyvinyl chloride body, ball and stem, end entry, double union design, solvent weld socket ends, or single union ball valve with flanged ends drilled to ASME B 16.5, Class 150, elastomer seat, Viton or Teflon O-ring stem seals, full ported ball. Ball valves shall be Hayward True Union or contractor approved alternate.

2.10.4 Valve Schedule (Each Crest Pad Building)

<u>Valve No.</u>	<u>Description</u>
CV1	1 1/2 inch check valve
CV2	1 1/2 inch check valve
CV3	3 inch check valve

BV1, BV11	1 1/2 inch manually operated ball valve, discharge line
BV2, BV22	1 1/2 inch manually operated ball valve, recirculation line
BV3, BV33	3 inch manually operated ball valve
BV4	1 1/2 inch manually operated ball valve

2.10.5 Motor Actuated Plug Valves

Eccentric plug valves shall be of the non-lubricated eccentric type with cast iron bodies, resilient faced plugs, or a replaceable, resilient seat in the body. Resilient facing shall be suitable for the intended service. Valves shall have an unobstructed port area of not less than 80 percent of full pipe area, unless otherwise specified. Eccentric plug valves shall have a pressure rating of not less than 200 psi WOG, for bubble-tight shut-off. Motor operated plug valves shall be DeZurik PEC Eccentric Plug Valves with EIM Controls Inc. actuators, or CONTRACTOR approved alternate.

2.10.5.1 Motorized Valve Actuator

Equipment Requirements: Where electric motor actuators are indicated, an electric motor-actuated valve control unit shall be attached to the actuating mechanism housing by means of a flanged motor adapter piece.

Gearing. The motor actuator shall include the motor, reduction gearing, reversing starter, torque switches and limit switches in a weatherproof NEMA 4 assembly. The actuator shall be a single or double reduction unit consisting of spur or helical gears and worm gearing. The spur or helical gears shall be of hardened alloy steel and the worm gear shall be alloy bronze. Gearing shall be accurately cut with hobbing machines. Power gearing shall be grease- or oil-lubricated in a sealed housing. Ball or roller bearings shall be used throughout. Actuator output speed changes shall be mechanically possible by simply removing the motor and changing the exposed or helical gearset ratio without further disassembly of the electric actuator.

Starting Device. Except for modulating valves, the unit shall be so designed that a hammer blow is imparted to the stem nut when opening a closed valve or closing an open valve. The device should allow free movement at the stem nut before imparting the hammer blow. The actuator motor must attain full speed before stem load is encountered.

Switches and Wiring. Travel in the opening and closing directions shall be governed by a switch responsive to mechanical torque developed in seating the valve, or by an obstruction met in opening or closing the valve, or by an on-board microprocessor. The torque switch shall be adjustable and shall function without auxiliary relays or devices, or it shall be adjustable in one-percent increments, sensed by a pulse-counter that receives 15 pulses per rotation of the unit. The geared limit switches shall be of the open type and shall be actuated by a rotor cam with 4 contacts to each cam or gear train. The actuator shall have a number of gear trains as required to

produce the operation indicated. The actuator shall be wired in accordance with the schematic diagram. Wiring for external connections shall be connected to marked terminals. One 1 inch and one 1 1/4 inch conduit connection shall be provided in the enclosing case. A calibration tag shall be mounted near each switch correlating the dial setting to the unit output torque. Position limit switches and associated gearing shall be an integral part of the valve actuator. To provide the best possible accuracy and repeatability, limit-switch gearing shall be of the "counting" intermittent type, made of stainless steel, grease-lubricated, and enclosed in its own gear case to prevent dirt and foreign matter from entering the gear train. Switches shall not be subject to breakage or slippage due to over-travel. Traveling-nuts, cams, or microswitch tripping mechanisms shall not be used. Limit-switches shall be of the heavy-duty open contact type with rotary wiping action.

Handwheel Operation. A permanently attached handwheel shall be provided for emergency manual operation. The handwheel shall not rotate during electrical operation. The maximum torque required on the handwheel under the most adverse conditions shall not exceed 60-lb-ft, and the maximum force required on the rim of the handwheel shall not exceed 60 lb. An arrow and either the word "open" or "close" shall be cast or permanently affixed on the handwheel to indicate the appropriate direction to turn the handwheel.

Motor. The motor shall be of the totally-enclosed, non-ventilated, high-starting torque, low-starting current type for full voltage starting. It shall be suitable for operation on 480-volt, 3-phase, 60-Hz current, and have Class F insulation and a motor frame with dimensions in accordance with the latest revised NEMA MG Standards. The observed temperature rise by thermometer shall not exceed 131 degrees F above an ambient temperature of 104 degrees F when operating continuously for 15 minutes under full rated load. With a line voltage ranging between 10 percent above to 10 percent below the rated voltage, the motor shall develop full rated torque continuously for 15 minutes without causing the thermal contact protective devices imbedded in the motor windings to trip or the starter overloads to dropout. All bearings shall be of the ball type and thrust bearings shall be provided where necessary. All bearings shall be provided with suitable seals to confine the lubricant and prevent the entrance of dirt and dust. Motor conduit connections shall be watertight. Motor construction shall incorporate the use of stator and rotor as independent components from the valve operation such that the failure of either item shall not require actuator disassembly or gearing replacement. The motor shall be furnished with a space heater suitable for operation on 120-volt, single-phase, 60-Hz circuit unless the entire actuator is a hermetically-sealed, non-breathing design with a separately sealed terminal compartment that prevents moisture intrusion.

Actuator Appurtenances. The actuator for each valve shall be supplied with open and close status lights, open, close and lock-out-stop push-buttons, and other devices indicated.

Starter. The starter shall be a suitably sized amperage rated reversing starter with its coils rated for operation on 120-volt, 1-phase, 60-Hz current. A control power transformer shall be included to provide a 120-volt source, unless otherwise indicated. The starter shall be equipped with 3 overload relays of the automatic reset type. Its control circuit shall be wired in accordance with drawing and manufacturer's instructions.

The integral weatherproof compartment shall contain a suitably sized 120-volt ac, single phase, 60 Hz space heater to prevent moisture condensation on electrical components.

2.11 FLOW METERS

The SUBCONTRACTOR shall furnish and install meters and flow measurement devices with associated instrumentation and controls as shown and specified herein, complete and operable, for functions including flow measurement and batch metering of fluids including leachate, in accordance with the requirements of the Subcontract Documents.

2.11.1 Paddle Meters

The SUBCONTRACTOR shall furnish and install the following paddle meters:

I.D. No.	Service	Location/ Cell	Pipe Size	Flow Range	Inlet Pressure in W.C.	Service Temp.
2-M-26	Leachate	9	3 inch	0-200 gpm	50 ft	70 °F
2-M-27	Leachate	9	1 inch	0-30 gpm	70 ft	70 °F
2-M-28	Leachate	9	1 inch	0-30 gpm	70 ft	70 °F
2-M-29	Leachate	10	3 inch	0-200 gpm	50 ft	70 °F
2-M-30	Leachate	10	1 inch	0-30 gpm	70 ft	70 °F
2-M-31	Leachate	10	1 inch	0-30 gpm	70 ft	70 °F

The paddle wheel insertion meter shall be constructed of materials suitable for the intended service. The meter stem shall contain an electronic pickup, sensing the passage of each rotor blade. A pulsed output obtained shall produce a repetition rate directly related to flow velocity. The meter shall be capable of registering flow with an accuracy of ± 2 percent over a 10 to 1 range, with a negligible pressure loss.

The meter inserts shall be made of Type 316 stainless steel or of plastic material suitable for the intended service. The shaft material shall be stainless steel, titanium, or Hastelloy. The paddle wheels shall be of Type 316 stainless steel or suitable plastic.

The meter inserts shall be mounted securely through a screwed, flanged, welded, or socket-welded tee connection or fitting, for precise positioning in the pipeline. The fittings shall be of the same material as the pipeline unless otherwise called out. The mounting hardware or probe shall include a clear indicating device to correctly position the meter insert in the pipeline.

A transmitter shall be provided for remote indication of flow and totalized quantity.

The Paddle Meter shall be +GF+Signet Model No. P51530-PO standard mount paddlewheel or CONTRACTOR approved alternate.

The flow meter gauge shall be +GF+Signet Model 5500 flow monitor or CONTRACTOR approved alternate.

2.12 MANHOLES

Precast reinforced concrete manhole sections shall conform to ASTM C478. Joints shall be cement mortar, or an approved mastic or rubber gasket, or an approved combination of these types. Ladders shall be constructed on OSHA 1910 safety standards. Steel ladders and inserts shall be galvanized after fabrication in conformance with ASTM A123/A123M.

2.13 FLOOD SWITCHES NOT USED

~~Flood switches shall be water tight and capable of being submerged without adversely affecting electrical signal components. Flood switches shall be Genuine B-indicator Model GF-1 Amiers switch LAC110760 or CONTRACTOR approved alternate.~~

2.14 MISCELLANEOUS ITEMS

2.14.1 Valve Nameplates

Exposed valves shall have an attached stainless steel nameplate to list the manufacturer's name, address, component type or style, model or serial number, catalog number, capacity or size, and the system that is controlled. Plates shall be fixed in prominent locations with nonferrous screws or bolts. Valves shall be tagged with valve number in accordance with drawings.

2.14.2 Service Clamps

Service clamps shall have a pressure rating not less than that of the pipe to be connected and shall be the double flattened strap type. Clamps shall have a galvanized malleable-iron body with cadmium-plated straps and nuts. Clamps shall have a rubber gasket cemented to the body.

2.14.3 Pipe Supports

Drawings may not indicate pipe supports necessary to adequately support piping. Pipe supports in crest pad building shall consist of prefabricated galvanized double channel sections commercially manufactured for this purpose. Supports shall allow for vertical adjustment after erection. Supports shall be capable of supporting the piping and associated equipment as shown on the Drawings. Pipe shall be attached to channel sections using standard pipe clamps of correct dimension for the pipe. Pipe supports and accessories shall be hot-dipped galvanized and shall be provided from a single manufacturer. Pipe supports and accessories shall conform to MSS SP-58 and MSS SP-69.

3.0 EXECUTION

3.1 IDENTIFICATION OF PIPING

Identification of exposed pipes shall be accomplished by color-coding with bands and by lettering as specified in this specification. Color bands shall either be painted directly upon the pipe or shall be pressure-sensitive adhesive-backed vinyl cloth or plastic tape.

3.1.1 Labels

Each pipe identification shall consist of 2 color-coded bands, a printed label identifying the name of the pipe, and a flow arrow to indicate direction of flow in the pipe. Labels shall be preprinted on pressure-sensitive adhesive-backed vinyl cloth or plastic tape. Arrows shall be die-cut of the same type of material as the labels. Labels shall be placed on the outside of insulated piping systems.

3.1.2 Lettering

Letter sizes and colors for lettering, arrows, and background shall conform to ANSI A13.1.

3.2 IDENTIFICATION OF VALVES AND SHORT PIPE LENGTHS

3.2.1 General

Identifying devices for valves and the sections of pipe that are too short to be identified with color bands, lettered labels, and arrows shall be identified with metal tags as specified herein.

3.2.2 Tags

Metal tags shall be 16-gauge Type 304 stainless steel metal strips $\frac{3}{4}$ inch wide with $\frac{3}{16}$ -inch high letters stamped on the metal surface. Tags shall be designed to be firmly attached to the valves or short pipes or to the structure immediately adjacent to such valves or short pipes. Tags shall not interfere with equipment operations (i.e. valves, pumps, etc.)

3.3 PIPE INSTALLATION

3.3.1 Cutting of Pipe

Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise recommended by the manufacturer and authorized by the CONTRACTOR, cutting shall be done with an approved type mechanical cutter. Wheel cutter shall be used when practicable. Squeeze type mechanical cutters shall not be used for ductile iron or stainless steel pipe.

3.3.2 Joint Deflection

3.3.2.1 Flexible Plastic Pipe. Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the CONTRACTOR, but in no case shall it exceed 5 degrees.

3.3.3 Placing and Laying

Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other CONTRACTOR approved equipment. Under no circumstances shall any of the water-line materials be dropped or dumped into the trench. Care shall be taken to avoid abrasion of the pipe coating. Except where necessary to make connections with other lines or as authorized by the CONTRACTOR, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the coating or lining is damaged, the repair shall be made by the SUBCONTRACTOR at his expense in a satisfactory manner. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored, as shown.

3.3.3.1 Plastic Pipe Installation. PVC shall be installed in accordance with AWWA M23.

3.3.4 Connections

Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. Where made under pressure, these connections shall be installed using standard methods as approved by the CONTRACTOR.

3.3.5 Penetrations

Pipe passing through walls of valve pits and structures shall be provided with ductile-iron or Schedule 40 steel wall sleeves unless shown otherwise on the Drawings. Annular space between walls and sleeves shall be filled with rich cement mortar. Annular space between pipe and sleeves shall be filled with mastic.

3.3.6 Flanged Pipe

Flanged pipe shall only be installed above ground or with the flanges in valve pits.

3.3.7 Jointing

3.3.7.1 Polyvinyl Chloride (PVC) Plastic Pipe

- a. Pipe less than 4 inch diameter: Threaded joints shall be made by wrapping the male threads with approved thread tape or applying a CONTRACTOR approved lubricant, then threading the joining members together. The joint shall be tightened using strap wrenches to prevent damage to the pipe and fitting. To avoid excessive torque, joints shall be tightened no more than one thread past hand-tight. Solvent cement joints shall use sockets conforming to the requirements of ASTM D2467. The solvent cement used shall meet the requirements of ASTM D 2564; the joint assembly shall be made in accordance with ASTM D2855 and the manufacturer's specific recommendations.
- b. Pipe 4 inch through 12 inch diameter: Joints shall be elastomeric-gasket as specified in AWWA C900. Jointing procedure shall be as specified for pipe less than 4 inch diameter with configuration using elastomeric ring gasket.

3.3.7.2 Connections. Connections between different types of pipe and accessories shall be made with transition fittings approved by the CONTRACTOR.

3.3.8 Crest Pad Valves and Drain Lines

Valves shall be installed in accordance with AWWA Standards and manufacturer's recommendations

3.3.9 Pipe Supports

The pipe support system shall be installed in accordance with MSS SP-58, MSS SP-69, and the piping support system manufacturer's recommendations. Piping shall be rigidly supported and anchored so that there is no movement or visible sagging between supports.

3.4 HDPE PIPE INSTALLATION

- a. Pipe shall be handled and stored in such a manner as to ensure a sound, undamaged condition.
- b. Pipe shall be cut in a neat, workmanlike manner using a CONTRACTOR (based on manufacture information) approved mechanical cutter that will not damage the pipe.
- c. Joining of HDPE pipe to HDPE pipe shall be accomplished by thermal butt or electrofusion; no solvent or adhesive welding shall be allowed. Pipe shall be joined per ASTM D2657 and manufacturer's recommendations. Installation personnel who join HDPE pipe shall be experienced and certified in accordance

with pertinent sections of 49 CFR 192.285. The SUBCONTRACTOR shall submit a list of proposed joining personnel and their qualifications.

Single butt fusion welds shall be used to create pipe sections as long as practicable or as specified in the SUBCONTRACTOR's procedure. Fabricated pipe sections and fittings shall be joined by the double butt fusion process.

- d. During installation, the pipe shall not be pulled across sharp projections that could cause gouges, kinks, or other types of damage.
- e. The pipe shall not be dropped into the trench. The full length of the pipe shall be firmly bedded on the trench bottom. The pipe shall be bedded in such a way as to maintain grade with a tolerance of -0.0%, +0.5%.
- f. Temporarily close pipe ends and all perforations as required to avoid introducing dirt or other foreign material into the pipe. Dirt and other foreign material shall be removed before installation.
- g. Trenching and backfilling operations shall be conducted in accordance with the requirements of the Technical Specification for Site Work. Backfilling operations shall ensure that no voids are present under and at the sides of the pipe. Backfill shall initially be placed to the top of the pipe, and then hand compacted. The remainder of the trench shall then be backfilled and compacted by hand or with a power tamper only.
- h. Where flanged joints are used, the bolts shall be evenly torqued with a crossing pattern to gradually tighten the lug nuts. Flanged joints shall be retorqued after one hour or more has passed. Torque records shall be provided.
- i. Boots shall be welded to the surrounding liner and the HDPE pipe using methods specified in the Technical Specification for Cell Construction-Geosynthetics, as applicable.
- j. Flaws (minor imperfections, damaged areas, etc.) in HDPE pipe with a depth of 10% or less of the nominal wall thickness will not require repair or replacement. In double containment systems, carrier pipes with flaws deeper than 10% of the wall thickness shall be replaced. Single pipe or containment pipe with flaws between 10% and 25% of the wall thickness shall be repaired in accordance with the pipe manufacture's recommendations. The SUBCONTRACTOR shall certify in writing that the repaired area will have material properties that meet or exceed those of intact pipe. Any pipe with flaws deeper than 25% of the nominal wall thickness will be replaced.
- k. HDPE pipe thermal butt or electrofusion welding procedures shall be submitted.

- i. Sideslope Riser Pipes. With pipe in final location, insert submersible pump, discharge piping, and wiring to check pump location and to demonstrate that pipe is free from obstructions. Document and submit this check.
- m. Sump Level Transducer Access Pipes. With pipe in final location, insert to measurement location to demonstrate that pipe is free from obstructions. Document and submit this check.
- n. Weld Beads. Remove internal weld beads from the HDPE pipe installed on the side slopes and in the sumps where the leachate pumps and transducers will be installed. Remove debris from inside of pipes. The extracted internal fusion beads shall be subjected to visual inspection and conformation of its removal. Visual inspection shall include:
 - Verification that complete internal fusion bead removal was performed (This may be accomplished through examination of the extracted internal fusion bead, or by way of CCTV).
 - The extracted internal fusion bead appearance shall have the same double roll back semblance as does the external fusion bead.
 - The extracted internal fusion bead shall possess a smooth root cut, or verification of pipe smoothness by use of CCTV.
 - Removal of the internal bead may include pipe wall mass. However any wall mass that is removed should not exceed 1/10th of the pipe wall thickness itself.

3.5 ACCEPTANCE TESTING

The SUBCONTRACTOR shall perform acceptance testing of all non-perforated pipelines that carry liquid. Riser pipes functioning as carrier pipes for leachate pumps and level monitoring equipment do not require acceptance testing. Where the pipes will be covered with liner, gravel, soil, etc., the SUBCONTRACTOR shall complete the required testing and receive approval by the CONTRACTOR prior to burying the pipe or covering the pipe.

Testing procedures shall be submitted.

CONTRACTOR shall be notified prior to performing acceptance testing. CONTRACTOR, or others designated by the CONTRACTOR, shall witness acceptance tests. Failure to notify the CONTRACTOR 24 hours, prior to testing, may cause the SUBCONTRACTOR to postpone or perform the test again.

3.5.1 General

Provide test equipment and materials, including test pumps, gauges, water, volumetric measuring equipment, and other equipment required. Pressure gauges used shall be graduated in increments not greater than 1 psi and shall have range of approximately twice the test pressure. Use only calibrated gauges and instruments. Provide calibration certificates traceable to NIST. Gauge serial numbers shall be traceable to tests performed.

Hold test pressure for 1 hour. Test time will be accrued only while full test pressure is applied to system. After the pressure has been increased to the required test value and held for one hour, the pressure is to be decreased to 0 psi while observations are made for leakage. The pressure is again to be slowly increased to the test pressure and held for one more hour while observations are made for leakage and the leakage measurement is made.

The pipeline should be prepared 24 hours prior to testing by filling it with water, in a manner to remove air (piping sections with elevation changes shall be vented in accordance with a fill and venting procedure prior to testing). The test pressure should be applied to stabilize the system. This should minimize losses due to entrapped air, changes in water temperature, distention of components under pressure, movement of gaskets, and absorption of air by the water and water by the pipe wall.

During testing, remove from systems any equipment that would be damaged by test pressure. Replace removed equipment after testing. Where new pipe connects to existing piping, the joint between the two pipes shall be tested. Correct leaks by remaking joints with new material; makeshift remedies will not be permitted. Welded pipe attachments (hangers, etc.) shall be installed prior to testing.

Systems may be tested in sections as work progresses; however, any previously tested portion shall become a part of any later test of composite system. Test records shall include marked up drawings indicating which piping was tested.

The SUBCONTRACTOR shall be responsible for providing temporary fillings, plugs, pressure relief devices, and thrust blocking for testing at the specified pressure. A pressure relief device shall be provided for each piping section being tested. The device shall have a set pressure not higher than 5 percent of the test pressure.

Tests shall be made by the SUBCONTRACTOR in the presence of the CONTRACTOR. The certificate shown in NFPA 24 Figure 10.10.1 shall be completed by SUBCONTRACTOR.

Additives, corrosive chemicals such as sodium silicate, brine, or other chemicals shall not be used while hydrostatically testing systems or for stopping leaks.

Acceptance Criteria:

The test is acceptable if the measured pressure remains within 5 percent of the test beginning pressure throughout the specified test duration. There shall be no indications, visible or

otherwise of leakage, unless specified otherwise, for the piping at the specified test pressure throughout the specified duration.

3.5.2 Buried Pipe Testing

The trench shall be backfilled between joints before testing to prevent movement of pipe. Tests shall be made before the joints are covered so that any leaks may be readily detected. Where any section of a pipe is provided with concrete thrust blocking, the tests shall not be made until at least 5 days after installation of the concrete thrust blocking, unless otherwise approved by the CONTRACTOR. If the joints are covered with backfill prior to testing, the SUBCONTRACTOR remains responsible for locating and correcting any leakage in excess of that permitted in Section 3.4.1.

3.5.2.1 HDPE Pump Discharge Pipes

Hydrostatically pressure test to 70 psi minimum (+ 5% allowed).

3.5.2.2 PVC Crest Pad Pipe

Test with piping in final location. Hydrostatically pressure test to 70 psi (+ 5% allowed) with gage located in crest pad building.

3.5.2.3 HDPE Double Contained Pipe

Test with piping in final location. Hydrostatically pressure test the carrier pipe (inner pipe) of double containment piping shall be hydrostatically pressured tested with a beginning test pressure between 30 psi and 40 psi. The containment pipe (outer pipe) of double containment piping can be either hydrostatically or pneumatically tested with a beginning test pressure between 10 psi and 15 psi.

Carrier pipe (inner pipe) shall be full of water when containment pipe is pressure tested.

3.5.3 Raw Water Pipe

Permanent raw water lines installed by the SUBCONTRACTOR to support construction activities shall be tested hydrostatically at 175 psi (+ 5% allowed) for two hours.

Minimum test procedure is as follows: The water pressure is to be increased in 50-psi increments until the test pressure is attained. After each increase in pressure, observations are to be made of the stability of the joints. These observations are to include such items as protrusion or extrusion of the gasket, leakage, or other factors likely to affect the continued use of a pipe in service. During the test, the pressure is not to be increased by the next increment until the joint has become stable. This applies particularly to movement of the gasket. After the pressure has been increased to the required test value and held for one hour, the pressure is to be decreased to 0 psi while observations are made for leakage. The pressure is again to be slowly increased to

the value specified in the above paragraph and held for one more hour while observations are made for leakage and the leakage measurement is made.

The amount of leakage in buried piping shall be measured at the specified test pressure by pumping from a calibrated container. For new pipe, the amount of leakage at the joints shall not exceed two quarts per hour per 100 gaskets or joints irrespective of pipe diameter. No visible leakage shall be allowed in aboveground piping. The amount of allowable leakage shall be permitted to be increased by one fluid ounce per inch valve diameter per hour for each metal seated valve isolating the test section.

3.6 CLEANING

Clean all piping as required to remove foreign materials including dirt, grease, shavings, and other matter. Debris and surplus materials resulting from work, as a result of this installation effort, shall be removed.

3.7 QUALITY ASSURANCE/QUALITY CONTROL

Construction Quality Control and Testing requirements are provided in Construction Quality Requirements, Specification No. 0600X-SP-G0048.

At locations where the field testing conducted by either the SUBCONTRACTOR, CONTRACTOR, or CQA Subcontractor indicates that conditions are outside the acceptable limits of the specifications, the filing area shall be reworked or removed and replaced. These areas shall be retested and the repair process repeated as necessary until passing results are achieved.

The SUBCONTRACTOR shall maintain and supply to CONTRACTOR records of his quality control for operations including but not limited to the following:

- (1) Delivery, storage, and handling of devices and equipment used.
- (2) Conformance of materials to the requirements of this specification.
- (3) Inspection of devices and equipment installed
- (4) Field testing of devices and equipment.
- (5) Installation of devices and equipment to these requirements and applicable codes and standards.

Copies in duplicate of these records and tests, as well as records of corrective action taken when results are unsatisfactory, shall be furnished to the CONTRACTOR within 1 working day following the inspection or test.

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J.R.	T2-10	
X	Howard, B.J.	T2-10	
X	Klickovich, B.D.	T2-10	
X	Looney, D.	H4-17	X
	Melvin, W.F.	T2-10	
	Palmersheim, S.M.	H4-17	
X	Schilperoort, D.L.	T2-10	
X	Skiba, C.V.	T2-10	X
X	Wintle, T.E.	T2-10	X
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
X	Borlaug, W.A.	T2-03	X
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

<u>Subcontract/No.</u>	<u>Change Notice</u>	<u>Description</u>
TradeWind, S012308A00	CN- _____	_____
DelHur, S010544A00	CN- _____	_____
W.Boos, 0600X-SC-G0524	CN- _____	_____
Envirotech, S66X528A00	CN- 005	Construction Subcontract Spec. Revisions

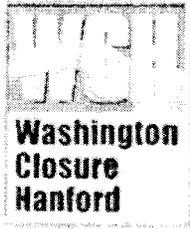
Comments: (Specs. # C0077, 78 82, 32, all Rev. 1)


 Distribution Completed: Yes: **X** No: Initials **DJ7**

TO BE COMPLETED BY R&DC:

RECORD TYPE _____
 DATA ENTRY BY _____ SCANNED/# PGS _____
 REPRO BY _____ DOCS OPEN # _____





149862

April 20, 2010

Mr. Joe Voss, Project Manager
Envirotech Engineering and Consulting, Inc.
2620 Fermi Ave. MSIN: T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00 **CHANGE NOTICE CN-004, CONSTRUCTION QUALITY ASSURANCE (CQA) PLAN, REVISION 1 (FUNDED BY AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009)**

Dear Mr. Voss:

Please find attached Change Notice CN-004, *Construction Quality Assurance Plan, Revision 1*, for your incorporation into the Subcontract. Please replace the CQA Plan 0600X-QA-G0005, Rev. 0, with the attached Rev. 1. The revisions were made to the CQA Plan, Table 4.1.2 Admix Soil Liner, to clarify that only Stage 1 - Vertical Hydraulic Conductivity of the Two-Stage, Cased Borehole Test (Boutwell) shall be performed.

Should you have any questions, regarding this change notice, please feel free to contact me at (509)373-9476 or (509)942-9275.

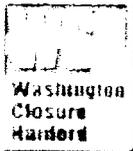
Sincerely,

A handwritten signature in black ink that reads 'C. Skiba'.

for Charles V. Skiba
Subcontract Technical Representative
Washington Closure Hanford

CVS:djt

Attachment: Change Notice 004
CQA Plan, 0600X-QA-G0005, Revision 1 (Pages 1 - 51)



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL

Subcontractor: Envirotech Engineers and Consultants, Inc.
 Address: 2620 Fermi Ave., MSIN T2-11
 Richland, WA 99354
 Mr. Joe Voss, Project Manager

Job No. 14655

Letter No.:

Effective Date:

Subcontract No.: S013213A00

Change Notice No.: 004 Page 1 of 1

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

Revisions to the Construction Quality Assurance Plan Regarding Two-Stage, Cased Borehole Test [Funded by the American Recovery and Reinvestment Act of 2009 (ARRA)]:

1. Replace the Construction Quality Assurance Plan 0600X-QA-G0005, Rev. 0 in Exhibit D, Attachment A with the attached Construction Quality Assurance Plan 0600X-QA-G0005, Rev. 1. Revisions were made to clarify that only Stage 1 - Vertical Hydraulic Conductivity of the Two-Stage, Cased Borehole Test (Boutwell) shall be performed.

Attachments:

1. Construction Quality Assurance Plan 0600X-QA-G0005, Rev. 1

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within <u>18</u> days ^{CVS 4-14-10}
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM:

William F. Melvin *W.F. Melvin* 4-15-10
 Print Name Signature Date

STR:

Charles V. Skiba *Charles V. Skiba* 4-15-10
 Print Name Signature Date

Procurement:

Dana D. Looney *Dana D. Looney* 4-15-10
 Print Name Signature Date

Initial: N/A N/A N/A N/A N/A

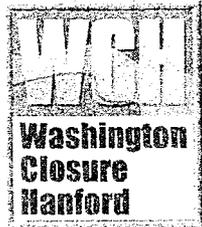
Safety MAW QA Eng. Env. RadCon

Acknowledge and accept this change notice as specified.

Acknowledge and accept with the exception of the following:

<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within _____ days
		<input type="checkbox"/> Will not be submitted

Signature _____ Company _____ Date _____



149846

April 7, 2010

Mr. Joe Voss, Project Manager
Envirotech Engineering and Consulting, Inc.
2620 Fermi Ave. MSIN: T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00 **CHANGE NOTICE CN-003, EXHIBIT A, REVISION 8, FOR CERTIFIED PAYROLL SUBMISSIONS. FUNDED BY AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009**

Dear Mr. Voss:

Please find attached Change Notice CN-003, *Exhibit A, Revision 8, for Certified Payroll Submissions* for your review. Replace Subcontract Exhibit A, Rev. 7, dated January 11, 2010, with Exhibit A, Rev.8, dated March 23, 2010 (attached). This revision to Exhibit A is effective immediately upon Subcontractor receipt. Subcontractor signature of this change notice is acknowledgement of Subcontractor's implementation of the revised flow down.

The Department of Energy-Richland Operations Office (DOE-RL) has modified Prime Contract Number DE-AC06-05RL14655, with Washington Closure Hanford (WCH), and requires WCH to flow down the following revisions to all construction Subcontractors.

Exhibit A, Revision 8, General Conditions, is issued to Envirotech Engineering and Consulting, Inc., to incorporate a revision to General Condition (GC) 9.19 "Government Flowdowns", FAR Clause 52.222-8, "Payrolls and Basic Records" (Nov 2009) (previously dated Feb 1988).

Subcontractors shall strictly adhere to the provisions stated in the revised clause. In summary, this revision requires that Certified Payroll forms be immediately modified to remove individual Social Security Numbers (SSN) and personal addresses known as Personal Identification Information (PII). Another uniquely identifiable number is to be assigned in place of the SSN for each employee. While the FAR Clause states that the last four digits of the SSN is acceptable, the local DOE-RL Office has informed WCH that the last four digits are considered Personally Identifiable Information (PII) and, therefore, unacceptable for this purpose. Further, Subcontractors shall ensure that any PII is readily available if requested by DOE-RL or WCH.

Mr. Voss
Page 2

It is no longer necessary to use the Government's Certified Payroll form, provided that all the information is supplied as set forth on the form located at:

<http://www.dol.gov/whd/forms/wh347.pdf>

This is the total extent of Exhibit A, Revision 8, General Conditions.

Should you have any questions, regarding this change notice, please feel free to contact me at (509)373-9476 or (509)942-9275.

Sincerely,



Charles V. Skiba
Subcontract Technical Representative
Washington Closure Hanford

CVS:djt

Attachment: Change Notice 003
Exhibit A, Revision 8, Certified Payroll Submissions



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: Envirotech Engineers & Consultants, Inc.	Letter No.:
Address: 2620 Fermi Ave. MSIN T2-11 Richland, WA 99354 Attn: Mr. Joe Voss, Project Manager	Effective Date: 4/7/2010
	Subcontract No.: S013213A00
Change Notice No.: CN-003	Page 1 of 1

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

CHANGE NOTICE CN-003, EXHIBIT A, REVISION 1, CERTIFIED PAYROLL SUBMISSIONS FUNDED BY THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA).

Replace Subcontract Exhibit A, Rev. 7, dated January 11, 2010 with Exhibit A, Revision 8, dated March 23, 2010.

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within ____ days
<input type="checkbox"/> Drawings/Data attached	<input type="checkbox"/>

Project Manager/CAM:

W.F. Melvin		4-6-10
Print Name	Signature	Date

STR:

Charles V. Skiba		4-6-10
Print Name	Signature	Date

Procurement:

Dana D. Looney		4-6-10
Print Name	Signature	Date

Initial: N/A N/A N/A N/A N/A

Safety QA Eng. Env. RadCon

Acknowledge and accept this change notice as specified.

Acknowledge and accept with the exception of the following:

<input type="checkbox"/> ARE proceeding with this change notice	A proposal:	<input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice		<input type="checkbox"/> Will be submitted within ____ days
		<input type="checkbox"/> Will not be submitted

Signature:	Company: Envirotech Engineers and Consultants	Date:
------------	---	-------

EXHIBIT A CONSTRUCTION SUBCONTRACTS GENERAL CONDITIONS

DO NOT ALTER THIS DOCUMENT

REV.	DATE	Explanation	Originator	Checker
08	March 23, 2010	Add Deviation to FAR Clause 52.222-8 (NOV 2009)	L. N. Cortez	R. M. Harrison
07	December 31, 2009	Initiate E-Verify Requirements in FAR Clauses	L. N. Cortez	R. M. Harrison
River Corridor Closure Project			Subcontractor Terms & Conditions	

EXHIBIT "A"

WASHINGTON CLOSURE HANFORD, LLC

CONSTRUCTION SUBCONTRACTS

GENERAL CONDITIONS

WASHINGTON CLOSURE HANFORD LLC

EXHIBIT "A"

TABLE OF CONTENTS

1.0 SCOPE 1

2.0 STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES 1

3.0 DEFINITIONS 1

4.0 ENTIRE AGREEMENT 1

5.0 SUBCONTRACT INTERPRETATION 2

6.0 ORDER OF PRECEDENCE 2

7.0 THE SUBCONTRACTOR 2

GC 7.1 Independent Contractor 2

GC 7.2 Permits and Licenses 2

GC 7.3 Labor, Personnel, and Site Work Rules or WCH Policy 3

GC 7.4 Hanford Site Training 3

GC 7.5 Security 3

GC 7.6 Environment, Safety and Health 6

GC 7.7 Site Conditions and Natural Resources 7

GC 7.8 Differing Site Conditions 8

GC 7.9 Environmental Conditions 8

GC 7.10 Cultural Resources Awareness 9

GC 7.11 Worker Safety and Health Program (Civil Penalties Under 10 CFR 851 9

GC 7.12 Survey Control Points and Layouts 10

GC 7.13 SUBCONTRACTOR'S Work Area 10

GC 7.14 Cleaning Up 10

GC 7.15 Responsibility for Security of Work and Property 10

GC 7.16 SUBCONTRACTOR'S Plant, Equipment, and Facilities 11

GC 7.17 Illumination 12

GC 7.18 Use of CONTRACTOR's Construction Equipment or Facilities 12

GC 7.19 Warranty 12

GC 7.20 Inspection, Quality Surveillance, Rejection of Materials and Workmanship 13

GC 7.21 Testing 13

GC 7.22 Expediting 13

GC 7.23 Progress 14

GC 7.24 Excusable Delays 14

GC 7.25 Cooperation with Others 14

GC 7.26 Use of Completed Portions of Work 14

GC 7.27 Suspension 15

GC 7.28 Commercial Activities 16

GC 7.29 Publicity and Advertising 16

GC 7.30 Quality Assurance Program 16

GC 7.31 SUBCONTRACTOR Employee Concerns Program 16

GC 7.32 Workers Compensation Requirements 17

GC 7.33 Insurance 17

8.0 THE CONTRACTOR 21

GC 8.1 Authorized Representatives 21

GC 8.2 Medical Examinations 22

GC 8.3 First Aid Facilities 22

GC 8.4 Notices 22

GC 8.5 Changes 22

GC 8.6 Final Inspection and Acceptance 23

GC 8.7 Emergency Situation 24

9.0 GENERAL SUBCONTRACT PROVISIONS 24

GC 9.1 Applicable Law 24

GC 9.2 Words and Phrases 24

GC 9.3	Taxes	25
GC 9.4	Backcharges	25
GC 9.5	Examination of SUBCONTRACTOR's Record's and Accounts.....	26
GC 9.6	Title to Materials Found	26
GC 9.7	Termination for Default	26
GC 9.8	Termination for Convenience.....	27
GC 9.9	Non-Waiver	28
GC 9.10	Indemnity, Fines and Penalties	28
GC 9.11	Patent and Intellectual Property Indemnity.....	29
GC 9.12	Assignments and Subcontracts.....	29
GC 9.13	Survival	30
GC 9.14	Disputes.....	30
GC 9.15	Nondisclosure	30
GC 9.16	Procurement Integrity	31
GC 9.17	Rights in Data	31
GC 9.18	Continuity of Service.....	31
GC 9.19	Government Flowdowns.....	31

EXHIBIT "A"
CONSTRUCTION SUBCONTRACT GENERAL CONDITIONS

1.0 SCOPE

This Exhibit A provides General Terms and Conditions that apply to all Subcontracts providing Construction technical services to Washington Closure Hanford LLC.

2.0 STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES

- 2.1 Wherever references are made in this Subcontract to standards or codes in accordance with which the Work under this Subcontract is to be performed, the edition or revision of the standards or codes current on the effective date of this Subcontract shall apply unless otherwise expressly stated. If conflict occurs between any standards and codes referenced in the Subcontract Documents and any Subcontract Documents, the latter shall govern.
- 2.2 If SUBCONTRACTOR discovers any discrepancy or inconsistency between this Subcontract and any law, ordinance, statute, rule, regulation, order or decree, SUBCONTRACTOR shall report the same immediately, in writing, to CONTRACTOR who will issue such further instructions as may be necessary..
- 2.3 In performing Work under this Subcontract, the SUBCONTRACTOR shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), in effect at the time the work under this Subcontract is performed unless relief has been granted in writing by the appropriate regulatory agency.
- 2.4 If during the term of this Subcontract there are changed or new laws, ordinances, statutes, rules, regulations, orders or decrees not known or foreseeable at the time of signing this Subcontract that become effective and that affect the cost or time of performance of this Subcontract, SUBCONTRACTOR shall immediately notify CONTRACTOR in writing and submit detailed documentation of such effect in terms of both time and cost of performing the Subcontract. If the Work is affected by such changed or new laws, ordinances, etc., and CONTRACTOR concurs with the effect of such changes, an equitable adjustment in compensation and time of performance will be made, provided the OWNER approves such equitable adjustments in compensation and time of performance.

3.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH)

"SUBCONTRACTOR" means the legal entity which contracts with WCH.

"Subcontractor's Technical Representative" means the CONTRACTOR'S authorized representative.

"GOVERNMENT/OWNER" means the United States Government and/or the Department of Energy Richland Operations Office (DOE-RL).

4.0 ENTIRE AGREEMENT

This Subcontract embodies the entire agreement between the CONTRACTOR and SUBCONTRACTOR and supersedes all other writings. The parties shall not be bound by, or be liable for any statement, representation, promise, inducement, or understanding not set forth herein.

5.0 SUBCONTRACT INTERPRETATION

All questions concerning interpretation or clarification of this Subcontract, including the discovery of conflicts, errors or omissions, or the acceptable performance thereof by SUBCONTRACTOR, shall be immediately submitted in writing to the CONTRACTOR for resolution. All determinations, instructions, and clarifications of CONTRACTOR shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. At all times SUBCONTRACTOR shall proceed with the Work in accordance with the determinations, instructions, and clarifications of CONTRACTOR. SUBCONTRACTOR shall be solely responsible for requesting instructions or interpretations and shall be solely liable for any costs and expenses arising from its failure to do so.

6.0 ORDER OF PRECEDENCE

The Subcontract Agreement form or the Master Agreement form and individual Task Order Subcontracts, all documents listed therein, and subsequently issued Change Notices and modifications are essential parts of this Subcontract or Master Agreement and Task Order Subcontracts, and a requirement occurring in one is binding as though occurring in all. In resolving conflicts, discrepancies, errors, or omissions pursuant to the General Condition titled "SUBCONTRACT INTERPRETATION," the following order of precedence shall be used:

1. Subcontract Change Notices and Modifications, if any
2. Individual Task Order Subcontracts (which may include supplements to the Master Agreement)
3. The Subcontract Agreement Form or the Master Agreement Form
4. Exhibit "H" – Hanford Site Stabilization Agreement
5. Exhibit "C" – Schedule of Quantities and Prices
6. Exhibit "B" – Special Conditions
7. Exhibit "A" – General Conditions
8. Exhibit "G" – Subcontractor Safety and Health Requirements
9. Exhibit "J" – Subcontractor Environmental and Waste Management Requirements
10. Exhibit "K" – Integrated Work Control Program Procedure PAS-2-1.1 (if applicable)
11. Exhibit "D" – Scope of Work
12. Exhibit "F" – Drawings
13. Exhibit "E" – Technical Specifications
14. Exhibit "I" – Subcontractor Submittal Requirements Summary
15. Subcontractor Submittals

7.0 THE SUBCONTRACTOR

GC 7.1 Independent Contractor

SUBCONTRACTOR represents that it is fully experienced, properly qualified, registered, licensed, equipped, organized, and financed to perform the Work under this Subcontract. Subcontractor shall act as an independent contractor and not as the agent of CONTRACTOR or OWNER in performing this Subcontract, maintaining complete control over its employees and all of its lower-tier suppliers and subcontractors. Nothing contained in this Subcontract, or any lower-tier purchase order or subcontract awarded by SUBCONTRACTOR, shall create any contractual relationship between any lower-tier supplier or subcontractor and either CONTRACTOR or OWNER. SUBCONTRACTOR shall perform the Work hereunder in accordance with its own methods subject to compliance with the Subcontract.

GC 7.2 Permits and Licenses

Except as otherwise specified, SUBCONTRACTOR shall procure and pay for all permits, licenses, and inspections, other than inspections performed by CONTRACTOR and shall furnish any bonds, security, or deposits required by the Government, state, territory, municipality, or other political subdivision to permit performance of the Work hereunder. This includes, but is not necessarily limited to, identifying if such permits and licenses are required, compiling the information and data required for applications to obtain permits and licenses, filing of necessary applications for such permits and licenses, and providing any additional information or data required.

Where permits and licenses are furnished by the CONTRACTOR or OWNER, the SUBCONTRACTOR shall provide all reasonable assistance requested, including any necessary information or data.

GC 7.3 Labor, Personnel, and Site Work Rules or WCH Policy

- 7.3.1 SUBCONTRACTOR shall comply with FAR Clause 52.222.54, "Employment Eligibility Verification." To comply, SUBCONTRACTOR will enroll in E-Verify at www.dhs.gov/E-verify. Upon CONTRACTOR request, SUBCONTRACTOR shall provide CONTRACTOR a copy of its "Maintain Company" page, printed directly from E-Verify.
- 7.3.2 SUBCONTRACTOR shall employ only competent and skilled personnel to perform the Work and shall remove from the Jobsite any SUBCONTRACTOR personnel determined by the CONTRACTOR to be unfit or to be acting in violation of any provision of this Subcontract, WCH, or Hanford Site policies. SUBCONTRACTOR is responsible for maintaining labor relations in such a manner that there is harmony among workers and shall comply with and enforce Jobsite procedures, regulations, and site work rules or WCH policy established by CONTRACTOR and OWNER.
- 7.3.3 SUBCONTRACTOR shall, to the extent permissible under applicable law, comply with the provisions of all labor agreement(s), inclusive of the Hanford Site Stabilization Agreement, which apply to the Work performed under this Subcontract (e.g., Project Agreement, collective bargaining agreement(s), etc.). SUBCONTRACTOR shall pay rates of wages and shall observe hours of Work and other economic terms and conditions of employment equivalent to those paid and observed by CONTRACTOR, all of which shall be subject to CONTRACTOR'S approval.
- 7.3.4 Work assignments and the settlement of jurisdictional disputes shall conform with either the Rules, Regulations, and Procedures of the Plan for Settlement of Jurisdictional Disputes in the Construction Industry, and any successor agreement thereto, or any other mutually established method of determining work assignments and settling jurisdictional disputes.

GC 7.4 Hanford Site Training

In the performance of work under this Subcontract, SUBCONTRACTOR shall adhere to all the training requirements as outlined and stipulated under Exhibit "G", Subcontractor Safety and Health Requirements. SUBCONTRACTOR is responsible for all labor costs for employees receiving training. SUBCONTRACTOR is also responsible for tuition costs for initial and annual refresher Radworker II training. SUBCONTRACTOR is responsible for all scheduling and coordination for Radworker II training. Additionally, SUBCONTRACTOR will be responsible for all costs incurred by CONTRACTOR for failure to report (no shows) to any scheduled training by SUBCONTRACTOR'S personnel and lower-tiers. All scheduling of HGET shall be given to STR at least two weeks in advance of the HGET training needed.

GC 7.5 Security

- 7.5.1 In the performance of the Work under this Subcontract, SUBCONTRACTOR shall comply with the following requirements from the CONTRACTOR/OWNER security program:
- 7.5.1.1 Incidents. Prompt verbal notification of incidents of loss, theft, vandalism, violence, threats, and misconduct to the CONTRACTOR, subsequently detailed in a written report.
- 7.5.1.2 Prohibited Articles. Property passes are required for the movement of prohibited articles into and out of any areas of the Hanford Site. Prohibited articles include:
- Dangerous weapons
 - Explosives, ammunition, and incendiary devices.
 - Controlled substances and drug paraphernalia.
 - Alcoholic beverages.
 - Contraband (includes other items prohibited by law).
- (a) The SUBCONTRACTOR will notify the CONTRACTOR if it becomes necessary to transport prohibited articles onto the Hanford Site. Upon CONTRACTOR and OWNER

approval, the CONTRACTOR will issue the appropriate property pass. SUBCONTRACTOR employees transporting prohibited articles within the Hanford Site must have a valid property pass in their possession.

- (b) SUBCONTRACTOR employees and employees of its lower-tier subcontractors discovered on the Hanford Site in possession of any prohibited article, and not in possession of a valid property pass, shall have their badge and prohibited article returned to the OWNER and their access to the Hanford Site suspended. If it is legally allowable for the individual to possess the prohibited article, the badge and prohibited article will be returned within two working days. If it is illegal for the individual to possess the prohibited article, the prohibited article will be turned over to local law enforcement and the individual's access to the Hanford Site will be denied for a minimum of one (1) year.

7.5.1.3

Security Badges. Any person assigned to work on the Hanford Site or any designated CONTRACTOR facility shall be required to wear a CONTRACTOR issued security badge identifying him/her. If any such persons are foreign nationals, special procedures shall apply when applying for and receiving a security badge. The identification badge shall be worn in plain view, above the waist, on the front of the body, on the outer most layer of clothing. If required, a dosimeter will be issued in conjunction with the security badge.

- (a) Badging for more than seven (7) days requires SUBCONTRACTOR employees, and employees of their lower-tier subcontractors, vendors, and visitors to complete Hanford General Employee Training (HGET).
- (b) SUBCONTRACTOR shall provide to CONTRACTOR the individual(s) complete name (as it appears on the photo identification to be used), name and address of the company being represented, reason for access, social security number, date of birth (mm/dd/yyyy), place of birth (city, state/province, country), and citizenship of the individual(s) requiring a badge at least two (2) working days prior to the date the employee(s) first require the badge(s) for work performance.
- (c) It is the responsibility of the SUBCONTRACTOR to provide the CONTRACTOR with a minimum of two (2) weeks notice if the SUBCONTRACTOR will be requesting access to the work site for a foreign national. This will extend to six (6) weeks notice if the foreign national is from a sensitive country as defined by the OWNER.
- (d) Badges will be issued by CONTRACTOR at locations and according to schedules provided by the CONTRACTOR. Central Badging Office hours are normally 7:00 a.m. through 4:30 p.m., Monday through Thursday, and 7:00 a.m. through 3:30 p.m., Friday. CONTRACTOR temporary badging hours are normally 6:30 a.m. through 5:00 p.m., Monday through Thursday.
- (e) The employee, vendor, or visitor must appear in person to obtain a badge. Badge applicants must provide proof of identification and completion of HGET to the issuing office.
- (f) The OWNER will issue security badges free of charge.
- (g) Security badges will be valid only for the duration of a specific Subcontract or for one (1) calendar year from the date of issuance, whichever ends first. If a Subcontract extends beyond one (1) year, SUBCONTRACTOR employees must obtain a new badge prior to the expiration date of the current badge.
- (h) A new security badge must be obtained whenever there is a significant change in facial appearance, e.g., growth or removal of facial hair, changes resulting from surgery, etc.

(i) U.S. Department of Energy (DOE) security badges are the property of the Government and must be returned to the CONTRACTOR whenever an individual is transferred, terminates employment or otherwise no longer requires the badge. Badges of departing visitors shall be turned over to CONTRACTOR or security force personnel at the conclusion of the visit at the final security checkpoint. It is the responsibility of the SUBCONTRACTOR to implement a Badge Recovery Policy to ensure its employees, vendors and sub-tier personnel:

- § Report a lost or stolen badge to the CONTRACTOR'S representative within twenty-four (24) hours of discovery,
- § Return the security badge to the CONTRACTOR when no longer valid or when requested to by CONTRACTOR, OWNER, and/or protective (security) force personnel.

(j) A charge of \$1,000.00 will be assessed to the SUBCONTRACTOR for each security badge that is not returned. Such charges will be deducted from payments otherwise due the SUBCONTRACTOR. Refund of charges, previously collected for badges and/or dosimeters subsequently found may not be made after the date of final payment to the SUBCONTRACTOR.

(k) The SUBCONTRACTOR is responsible for all labor costs associated with the badging and security training requirements.

7.5.1.4 Security Orientation. Each SUBCONTRACTOR visitor/vendor, and visitor/vendors of their lower-tier subcontractors, will receive a security orientation booklet from the CONTRACTOR or OWNER prior to being issued a visitor security badge.

7.5.1.5 Computer Security. Each SUBCONTRACTOR employee, and employees of their lower-tier subcontractors that are granted access to the CONTRACTOR or OWNER information networks, are required to adhere to the restrictions and limitations of the CONTRACTOR computer security program. These requirements can be obtained from the CONTRACTOR Computer Protection Program Manager.

7.5.1.6 "Official Use Only" Information Security. Each SUBCONTRACTOR employee, and employees of their subcontractors that are granted access to "Official Use Only" sensitive unclassified information provided by the CONTRACTOR/OWNER of the information must adhere to the restrictions and limitations of the CONTRACTOR regarding the access, control, and destruction of the information. These requirements include ensuring that any SUBCONTRACTOR employee or employees of their subcontractors having access to the information meet the following requirements:

- (a) The employee granted access to the information has a need to know.
- (b) Advise the employee not to divulge the information to persons who do not have a need to know.
- (c) Provide protection against theft or unauthorized removal/distribution of the information.
- (d) When use of the information is completed, any documents or data shall be destroyed by shredding in accordance with established procedures.

7.5.1.7 A Security Program Plan shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any even prior to commencing Work at the Jobsite. The Program Plan shall include a description of how the SUBCONTRACTOR will implement the applicable requirements of this section and the additional requirements below.

- (a) Controlled access to office, warehouse, material and equipment sites.
- (b) Accountability procedures for the requisition and issue of materials.
- (c) Periodic security checks for all work areas assigned to SUBCONTRACTOR.
- (d) Prompt reporting of incidents of loss, theft, or vandalism to CONTRACTOR, subsequently detailed in writing.
- (e) Coordination and compliance with Site security programs.

7.5.2 The written Security Program Plan is set forth in Exhibit I and is a required Subcontractor Submittal.

7.5.3 Security of Work. SUBCONTRACTOR shall, at all times, conduct all operations under this Subcontract in a manner to avoid the risk of loss, theft, or damage by vandalism, sabotage, or any other means to any work, materials, equipment, or other property at the Jobsite. SUBCONTRACTOR shall continuously inspect all Work, materials and equipment to discover and determine any conditions that might involve such risks and shall be solely responsible for discovery, determination, and correction of any such conditions.

7.5.4 SUBCONTRACTOR shall comply with CONTRACTOR'S security requirements for the Jobsite. SUBCONTRACTOR shall cooperate with CONTRACTOR on all security matters and shall promptly comply with any project security arrangements established by CONTRACTOR or OWNER. Such compliance with these security requirements shall not relieve SUBCONTRACTOR of its responsibility for maintaining proper security for the above-noted items, nor shall it be construed as limiting in any manner SUBCONTRACTOR'S obligation with respect to all applicable laws and regulations and to undertake reasonable action to establish and maintain security conditions at the Jobsite.

7.5.5 The CONTRACTOR may also require that the SUBCONTRACTOR be removed from the job, at no additional cost to CONTRACTOR, employees who endanger persons or property, disruptive to the workforce, or whose continued employment under this Subcontract is inconsistent with the requirements of the Subcontract and/or interests of safety or security at the Hanford Site.

GC 7.6 Environment, Safety and Health

CONTRACTOR sets forth its full requirements for environment, safety and health in Exhibit "G", "Subcontractor Safety and Health Requirements," and Exhibit "J", "Subcontractor Environmental and Waste Management Requirements." These Exhibits, if included in this Subcontract, are fully integrated and a part hereof. The contents of Exhibit "G" and Exhibit "J" notwithstanding, the following applies to this Subcontract:

7.6.1 SUBCONTRACTOR shall be fully and solely responsible for conducting all operations under this Subcontract at all times in such a manner as to avoid the risk of harm to the environment, persons and/property. SUBCONTRACTOR shall continually and diligently inspect all Work, materials, and equipment to discover any conditions that might involve such risks and shall be solely responsible for discovery and correction of any such conditions.

7.6.2 SUBCONTRACTOR shall comply with CONTRACTOR'S Safety and Health Requirements including its Integrated Safety Management System (ISMS) Plan. SUBCONTRACTOR shall have sole responsibility for implementing its safety program. All of SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this General Condition titled "ENVIRONMENT, SAFETY AND HEALTH."

7.6.3 Neither CONTRACTOR nor OWNER shall be responsible for supervising the implementation of SUBCONTRACTOR'S safety program, and neither CONTRACTOR nor OWNER shall have responsibility for the safety of SUBCONTRACTOR'S or its lower-tier suppliers' or subcontractors' employees.

- 7.6.4 SUBCONTRACTOR'S failure to correct an unsafe condition or unsafe act or condition or act that negatively impacts the environment by its personnel after notice thereof shall be grounds for:
- (a) An order to suspend the affected operations until the unsafe condition is corrected and,
 - (b) If the violation continues, default termination of this Subcontract for such failure under the clause entitled, "Termination for Default," below.
- 7.6.5 SUBCONTRACTOR shall designate one or more (as appropriate) Environmental, Safety and Health (ES&H) Representatives(s) acceptable to CONTRACTOR who shall be resident at the Jobsite, have responsibility to correct unsafe conditions or unsafe acts, act on behalf of SUBCONTRACTOR on environment, health and safety matters, and participate in periodic environment, safety and health meetings with CONTRACTOR. SUBCONTRACTOR shall instruct its personnel on the CONTRACTOR'S Health and Safety Requirements and SUBCONTRACTOR'S safety program and shall coordinate with other subcontractors on safety matters.
- 7.6.6 SUBCONTRACTOR shall furnish safety equipment and enforce the use of such equipment by its employees.
- 7.6.7 SUBCONTRACTOR shall maintain accident, injury, and any other records required by applicable laws and regulations (e.g., OSHA, etc.) or by CONTRACTOR and shall furnish CONTRACTOR a monthly summary of injuries and labor hours lost due to injuries.

GC 7.7 Site Conditions and Natural Resources

- 7.7.1 SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the nature and location of the Work and the general and local conditions, including, but not limited to, the following:
- (a) Transportation, access, disposal, and handling and storage of materials.
 - (b) Availability and quality of labor, water, electric power and road conditions.
 - (c) Climatic conditions, tides, and seasons.
 - (d) River hydrology and river stages.
 - (e) Physical conditions at the Jobsite and the project area as a whole.
 - (f) Topography and ground surface conditions.
 - (g) Equipment and facilities needed preliminary to and during the performance of the Work.
 - (h) Radiological conditions of surface or subsurface.
- 7.7.2 The failure of SUBCONTRACTOR to acquaint itself with any applicable conditions will not relieve SUBCONTRACTOR of the responsibility for properly estimating either the difficulties or the cost of successfully performing SUBCONTRACTOR'S obligations under this Subcontract.
- 7.7.3 Where CONTRACTOR or OWNER has made investigations of subsurface conditions in areas where Work is to be performed under this Subcontract, such investigations are made by CONTRACTOR and OWNER for the purpose of study and design. If the records of such investigation are included in the Subcontract Documents, the interpretation of such records shall be the sole responsibility of SUBCONTRACTOR. Neither CONTRACTOR nor OWNER assumes any responsibility whatsoever in respect to the sufficiency or accuracy of such investigations, the records thereof, or of the interpretations set forth; and there is no warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such proportions different from those indicated may not be encountered.

GC 7.8 Differing Site Conditions

7.8.1 The Hanford Site was used for nuclear work related to the production of weapons for the defense of the country. Unidentified sources of radioactive material exist in Hanford Site soil. SUBCONTRACTOR shall promptly notify CONTRACTOR, in writing, before proceeding with any Work that SUBCONTRACTOR believes constitutes a differing site condition with respect to:

- (a) Subsurface or latent physical conditions at the Jobsite differing materially from those indicated in this Subcontract, or
- (b) Previously unknown physical conditions at the Jobsite, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Subcontract, or

7.8.2 CONTRACTOR will, as promptly as practicable, investigate such conditions and make a determination. If CONTRACTOR determines that such conditions do materially so differ and cause an increase or decrease in SUBCONTRACTOR'S cost of or the time required for performance of the Work under the Subcontract, an adjustment will be made and the Subcontract modified, in writing, accordingly. No claim of SUBCONTRACTOR under this clause will be allowed unless SUBCONTRACTOR has given the required notice.

GC 7.9 Environmental Conditions

7.9.1 Throughout performance of the Work, SUBCONTRACTOR shall conduct all operations in such a way as to minimize impact upon the natural environment and prevent any spread of contaminated or hazardous material. SUBCONTRACTOR shall provide:

- (a) Dust control of its operations within work and all other areas under its control and shall coordinate and cooperate with others for dust control in common areas.
- (b) Working machinery and equipment with efficient noise suppression devices and all other noise and vibration abatement measures necessary for the protection of workers and the public.
- (c) Suitable waste, sewage, sanitary, and garbage disposal methods and procedures approved by CONTRACTOR.
- (d) Provide suitable equipment, facilities, and precautions to prevent the discharge of contaminants into the atmosphere, any body of water, or land areas.
- (e) All documentation required by all levels of governing authority of this Subcontract concerning environmental requirements.
- (f) Responsibility for developing and maintaining a written Environmental Compliance Plan in accordance with SUBCONTRACTOR'S established practices, including, but not limited to, compliance with all applicable laws and all applicable requirements in the Project Environmental Control Plan. SUBCONTRACTOR shall have sole responsibility for developing, implementing, and enforcing its Environmental Compliance Plan and SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this clause.

7.9.2 SUBCONTRACTOR shall submit its written Environmental Compliance Plan to CONTRACTOR for review before commencing work at the Jobsite. The plan shall be submitted in accordance with Exhibit I and shall include all elements set forth in Exhibit J. CONTRACTOR'S review of SUBCONTRACTOR'S Plan shall not relieve SUBCONTRACTOR of its obligation under this Subcontract or as imposed by law, and SUBCONTRACTOR shall be solely responsible for the adequacy of its Environmental Compliance Plan.

7.9.3 If SUBCONTRACTOR encounters material on the Jobsite reasonably believed to be toxic or hazardous material or waste, which has not been addressed in this Subcontract, SUBCONTRACTOR shall

immediately stop work in the affected area and notify CONTRACTOR and OWNER of the condition. Pending receipt of written instructions from CONTRACTOR, SUBCONTRACTOR shall not resume work in the affected area.

GC 7.10 Cultural Resources Awareness

- 7.10.1 SUBCONTRACTOR shall comply with the provisions of the Native American Graves Protection Act 25 USC 3001-3013. This act establishes statute provisions for the treatment of Native American remains and cultural objects. If during the performance of this Subcontract, SUBCONTRACTOR discovers Native American remains and/or cultural objects, SUBCONTRACTOR shall immediately cease work in the affected work area, take reasonable efforts to protect the items discovered, and notify the CONTRACTOR'S STR. Work in the affected area may be prohibited for a period not to exceed thirty (30) calendar days. Cessation of work under the provisions of this article for periods of up to thirty (30) calendar days shall not be cause for an excusable delay.
- 7.10.2 Cultural resources are known to exist on the Hanford Reservation. The SUBCONTRACTOR shall use previously disturbed areas, whenever possible, while conducting work activities. The SUBCONTRACTOR shall also ensure workers are trained to recognize culturally significant resources. CONTRACTOR shall provide one (1) hour training for SUBCONTRACTOR employees on cultural resources awareness. SUBCONTRACTOR is responsible for all labor costs associated with this training. All workers shall be directed to visually inspect for cultural resources during all work activities, particularly in undisturbed areas. If any cultural resources are encountered, work in the vicinity of the discovery shall be suspended immediately. In the event of any such discoveries, the SUBCONTRACTOR shall notify the CONTRACTOR'S onsite representative immediately.

GC 7.11 Worker Safety and Health Program (Civil Penalties Under 10 CFR 851)

- 7.11.1 Section 3173 of Public Law 107-314, Bob Stump National Defense Authorization Act of Fiscal Year 2003 amends the Atomic Energy Act (AEA) by adding Section 234C, Worker Health and Safety Rules for Department of Energy Nuclear Facilities. The Department of Energy (DOE) promulgated Procedural Rules (10 CFR 851); Worker Safety and Health Program to comply with Section 234C. These rules govern the conduct of Contractor, Subcontractor and Supplier activities at DOE sites. Violation of the applicable rules will provide a basis for the assessment of civil penalties under the CFR ruling on Contractors, Subcontractors and Suppliers. Title 10 CFR 851 sets forth the procedures DOE (OWNER) will use in exercising its enforcement authority, including the issuance of "Notices of Violation" and the resolution of an administrative appeal in the event the Contractor or Subcontractor elects to petition the Office of Hearings and Appeals for Review.
- 7.11.2 This Subcontract or Purchase Order is subject to the requirements of 10 CFR 851, if under its terms the Supplier or Subcontractor is required to perform work at the Hanford Site.
- 7.11.3 DOE (OWNER) may assess civil penalties of up to \$70,000 per violation per day. If any violation is a continuing violation, each day of the violation shall constitute a separate violation for the purpose of computing the civil penalty.
- A. A Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists or from one or more practices, means, methods, operations or processes which have been adopted or are in use, in such a place of employment. Severity Level I violation would be subject to the base civil penalty of up to 100% of the maximum base civil penalty of \$70,000.
- B. A Severity Level II violation is an other than serious violation. An other than serious violation occurs where the most serious injury or illness that would potentially result from a hazardous condition cannot be reasonably predicted to cause death or serious physical harm to employees but does have a direct relationship to their safety and health. A Severity Level II violation would be subject to the base civil penalty of up to 50% of the maximum base civil penalty or \$35,000.

7.11.4 Indemnification of Contractor (WCH). To the extent permitted by law, Subcontractor or Supplier assumes full responsibility and shall indemnify, hold harmless and defend WCH and its principal subcontractors, their agents, officers, employees, and directors from any civil liability under Section 234C of the Act or the implementing regulations at 10 CFR 851, arising out of the activities of the SUBCONTRACTOR or Supplier, its lower tier subcontractors, suppliers, agents, employees, officers or directors to the extent that the action or inaction of the Subcontractor or Supplier is found to be a direct or indirect cause of the assessment of fines or penalties or the cause of the institution of proceedings against WCH under Sections 234C of the Act. The Subcontractor's or Supplier's obligation to indemnify and hold harmless shall expressly include attorney's fees and other reasonable costs of defending any action or proceeding instituted under Section 234C of the Act of the implementing regulations at 10 CFR 851. A copy of the implementing regulations at 10 CFR 851 will be made available to the Subcontractor or Supplier upon request.

7.11.5 The contents of this article are to be flowed down to all sub-tier subcontractors and suppliers at any level who will perform work at the Hanford Site.

GC 7.12 Survey Control Points and Layouts

7.12.1 Survey control points, as shown on the drawings, will be established by CONTRACTOR.

7.12.2 SUBCONTRACTOR shall complete the layout of all Work and shall be responsible for all requirements necessary for the Work execution in accordance with the locations, lines, and grades specified or shown on the drawings, subject to such modifications as CONTRACTOR may require as Work progresses.

7.12.3 If SUBCONTRACTOR or any of its lower-tier subcontractors or any of their representatives or employees move or destroy or render inaccurate any survey control point, such control point shall be replaced by CONTRACTOR at SUBCONTRACTOR'S expense. No separate payment will be made for survey Work performed by SUBCONTRACTOR.

GC 7.13 SUBCONTRACTOR'S Work Area

All SUBCONTRACTOR Work areas on the Jobsite will be assigned by CONTRACTOR. SUBCONTRACTOR shall confine its operations to the areas so assigned. Should SUBCONTRACTOR find it necessary or advantageous to use any additional off-site area for any purpose whatsoever, SUBCONTRACTOR shall, at its expense, provide and make its own arrangements for the use of such additional off-site areas.

GC 7.14 Cleaning Up

7.14.1 SUBCONTRACTOR shall, at all times, keep its Work areas in a neat, clean, and safe condition.

7.14.2 Upon completion of any portion of the Work, SUBCONTRACTOR shall promptly remove from the Work area all its equipment, construction plant, temporary structures, and surplus materials not to be used at or near the same location during later stages of the Work.

7.14.3 Upon completion of the Work and before final payment, SUBCONTRACTOR shall, at its expense, satisfactorily dispose of all rubbish, remove all plant, buildings, equipment, and materials belonging to SUBCONTRACTOR and return to CONTRACTOR'S warehouse or Jobsite storage area all salvageable CONTRACTOR- or OWNER-supplied materials. SUBCONTRACTOR shall leave the premises in a neat, clean, and safe condition.

7.14.4 If SUBCONTRACTOR fails to comply with the foregoing, CONTRACTOR will accomplish same at SUBCONTRACTOR'S expense.

GC 7.15 Responsibility for Security of Work and Property

7.15.1 Work in Progress, Materials and Equipment. SUBCONTRACTOR shall be responsible for and shall bear any and all risk of loss of or damage to Work in progress, all materials delivered to the Jobsite,

and all materials and equipment until completion and final acceptance of the Work under this Subcontract.

7.15.2 Delivery, Unloading and Storage. SUBCONTRACTOR'S responsibility for materials and plant equipment required for the performance of this Subcontract shall include:

- (a) Receiving and unloading.
- (b) Storing in a secure place and in a manner subject to CONTRACTOR'S review. Outside storage of materials and equipment subject to degradation by the elements shall be in weather-tight enclosures provided by SUBCONTRACTOR.
- (c) Delivering from storage to construction site all materials and plant equipment as required.
- (d) Maintaining complete and accurate records for CONTRACTOR'S inspection of all materials and plant equipment received, stored, and issued for use in the performance of the Subcontract.

7.15.3 Property. SUBCONTRACTOR shall plan and conduct its operations so as not to:

- (a) Enter upon lands in their natural state unless authorized by CONTRACTOR.
- (b) Damage, close, or obstruct any utility installation, highway, road, or other property until permits have been obtained.
- (c) Disrupt or otherwise interfere with the operation of any pipeline, telephone, electric transmission line, ditch, or structure unless otherwise specifically authorized by this Subcontract.
- (d) Damage or destroy cultivated and planted areas, and vegetation such as trees, plants, shrubs, and grass on or adjacent to the premises which, as determined by CONTRACTOR, do not interfere with the performance of this Subcontract. This includes damage arising from performance of Work by operating equipment or stockpiling materials.

SUBCONTRACTOR shall not be entitled to any extension of time or compensation on account of SUBCONTRACTOR'S failure to protect all materials, equipment, and environment, as described herein. All costs in connection with any repairs or restoration necessary or required by reason of unauthorized obstruction, damage, or use shall be borne by SUBCONTRACTOR.

GC 7.16 SUBCONTRACTOR'S Plant, Equipment, and Facilities

- 7.16.1 SUBCONTRACTOR shall provide and use for the Work hereunder only such construction plant and equipment as are capable of producing the quality and quantity of Work and materials required by this Subcontract and within the time or times specified in the Subcontract Schedule.
- 7.16.2 Before proceeding with the Work hereunder, SUBCONTRACTOR shall furnish CONTRACTOR with information and drawings relative to such equipment, plant and facilities as CONTRACTOR may request. Upon written order of CONTRACTOR, SUBCONTRACTOR shall discontinue operation of unsatisfactory plant, equipment, or facilities and shall either modify the unsatisfactory items or remove such items from the Jobsite.
- 7.16.3 SUBCONTRACTOR shall, at the time any equipment is moved onto the Jobsite, present to CONTRACTOR an itemized list of all equipment and tools, including, but not limited to, power tools, welding machines, pumps, and compressors. Said list must include description and quantity, and serial number where applicable. It is recommended that SUBCONTRACTOR identify its equipment by color (other than yellow), decal, and etching. Before removing any or all equipment, SUBCONTRACTOR shall clear such removal through CONTRACTOR.
- 7.16.4 SUBCONTRACTOR shall not remove construction plant, equipment, or tools from the Jobsite before the Work is finally accepted, without CONTRACTOR'S written approval. SUBCONTRACTOR shall

obtain CONTRACTOR'S radiological release of all equipment used in radiological areas before removal.

GC 7.17 Illumination

When any Work is performed at night or where daylight is obscured, SUBCONTRACTOR shall, at its expense, provide artificial light sufficient to permit Work to be carried on efficiently, satisfactorily, and safely, and to permit thorough inspection. During such time periods, the access to the place of Work shall also be clearly illuminated. All wiring for electric light and power shall be installed and maintained in a safe manner and meet all applicable codes and standards.

GC 7.18 Use of CONTRACTOR's Construction Equipment or Facilities

Where SUBCONTRACTOR requests CONTRACTOR and CONTRACTOR agrees to make available to SUBCONTRACTOR certain equipment or facilities belonging to CONTRACTOR for the performance of SUBCONTRACTOR Work under the Subcontract, the following shall apply:

- (a) Equipment or facilities will be charged to SUBCONTRACTOR at agreed rental rates.
- (b) CONTRACTOR will furnish a copy of the equipment maintenance and inspection record, and these records shall be maintained by SUBCONTRACTOR during the rental period.
- (c) SUBCONTRACTOR shall assure itself of the condition of such equipment and assume all risks and responsibilities during its use.
- (d) SUBCONTRACTOR shall, as part of its obligation under the General Condition clause titled "INDEMNITY," release, defend, indemnify, and hold harmless CONTRACTOR and OWNER from all claims, demands and liabilities arising from the use of such equipment.
- (e) CONTRACTOR and SUBCONTRACTOR shall jointly inspect such equipment before its use and upon its return. The cost of all necessary repairs or replacement for damage other than normal wear shall be at SUBCONTRACTOR'S expense.
- (f) If such equipment is furnished with an operator, the services of such operator will be performed under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than the payment of wages, Workers' Compensation Insurance, or other benefits.

GC 7.19 Warranty

- 7.19.1 SUBCONTRACTOR warrants to CONTRACTOR and OWNER that equipment and materials furnished under this Subcontract shall be new, of clear title, and of the most suitable grade of their respective kinds for their intended uses, unless otherwise specified. All workmanship shall be first class and performed in accordance with sound construction practices acceptable to CONTRACTOR. All equipment, materials, and workmanship shall also conform to the requirements of this Subcontract.
- 7.19.2 SUBCONTRACTOR warrants all equipment and material it furnishes and all work it performs against defects in design, equipment, materials, or workmanship either for a period from Work commencement to a date twelve (12) months after Final Acceptance of the Project as a whole by OWNER or the standard commercial warranty period, whichever is more advantageous to the CONTRACTOR.
- 7.19.3 If at any time during the warranty period, CONTRACTOR, OWNER, or SUBCONTRACTOR discover any defect in the design, equipment, materials, or workmanship, immediate notice shall be given to the other parties, SUBCONTRACTOR shall, within a reasonable time, propose corrective actions to cure such defects to meet the requirements of this Subcontract.
- 7.19.4 CONTRACTOR, at its sole discretion, may direct SUBCONTRACTOR in writing and SUBCONTRACTOR agrees to:

- (a) Rework, repair, or remove and replace defective equipment and materials or re-perform defective workmanship to acceptable quality at a time and in a manner acceptable to CONTRACTOR.
- (b) Cooperate with others assigned by CONTRACTOR to correct such defects and pay to CONTRACTOR all actual costs reasonably incurred by CONTRACTOR in performing or in having performed corrective actions.
- (c) Propose and negotiate in good faith an equitable reduction in the Subcontract price in lieu of corrective action.

- 7.19.5 All costs incidental to corrective actions, including demolition for access, removal, disassembly, transportation, reinstallation, reconstruction, retesting, and reinspection, as may be necessary to correct the defect and to demonstrate that the previously defective work conforms to the requirements of this Subcontract, shall be borne by SUBCONTRACTOR.
- 7.19.6 SUBCONTRACTOR further warrants any and all corrective actions it performs against defects in design, equipment, materials, and workmanship for an additional period of twelve (12) months following acceptance by CONTRACTOR of the corrected Work or standard commercial warranty on product meeting standard warranty.

GC 7.20 Inspection, Quality Surveillance, Rejection of Materials and Workmanship

- 7.20.1 All material and equipment furnished and Work performed shall be properly inspected by SUBCONTRACTOR at its expense, and shall at all times be subject to quality surveillance and quality audit by CONTRACTOR, OWNER, or their authorized representatives who shall be afforded full and free access to the shops, factories, or other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for such quality surveillance or audit. SUBCONTRACTOR shall provide safe and adequate facilities, drawings, documents, and samples as requested, and shall provide assistance and cooperation, including stoppage of Work to perform such examination (as may be necessary) to determine compliance with the requirements of this Subcontract. Any Work covered before any scheduled quality surveillance or test by CONTRACTOR or OWNER shall be uncovered and replaced at the expense of SUBCONTRACTOR. Failure of CONTRACTOR or OWNER to make such quality surveillance or to discover defective design, materials, or workmanship shall not relieve SUBCONTRACTOR of its obligations under this Subcontract nor prejudice the rights of CONTRACTOR or OWNER thereafter to reject or require the correction of defective Work in accordance with the provisions of this Subcontract.
- 7.20.2 If any Work is determined by CONTRACTOR or OWNER to be defective or not in conformance with this Subcontract, the provisions of the General Condition clause titled "WARRANTY" shall apply.

GC 7.21 Testing

- 7.21.1 Unless otherwise provided in the Subcontract, testing of materials or Work shall be performed by SUBCONTRACTOR at its expense and in accordance with Subcontract requirements. Should tests (in addition to those required by this Subcontract) be desired by CONTRACTOR, SUBCONTRACTOR will be advised in ample time to permit such testing. Such additional tests will be at CONTRACTOR'S expense.
- 7.21.2 SUBCONTRACTOR shall furnish samples, as requested, and shall provide reasonable assistance and cooperation necessary to permit tests to be performed on materials or Work in place, including reasonable stoppage of Work during testing.

GC 7.22 Expediting

The material and equipment furnished and Work performed under this Subcontract shall be subject to expediting by CONTRACTOR or its representatives who shall be allowed full and free access to the shops, factories, and other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for expediting purposes.

As required by CONTRACTOR, SUBCONTRACTOR shall provide detailed schedules and progress reports for use in expediting and shall cooperate with CONTRACTOR in expediting activities.

GC 7.23 Progress

- 7.23.1 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR who shall thereupon take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the currently approved Subcontract Schedule, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of Work per week, and an increase in the amount of construction plant and equipment, all without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of Work and rate of progress required by this Subcontract.
- 7.23.2 Failure of SUBCONTRACTOR to comply with CONTRACTOR'S instructions may be grounds for determination by CONTRACTOR that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate, in accordance with the applicable provisions of this Subcontract, SUBCONTRACTOR'S right to proceed with the performance of the Subcontract.

GC 7.24 Excusable Delays

If SUBCONTRACTOR'S performance of this Subcontract is prevented or delayed by any unforeseeable cause, existing or future, which is beyond the reasonable control of the parties and without the fault or negligence of SUBCONTRACTOR, SUBCONTRACTOR shall, within twenty-four (24) hours of the commencement of any such delay, give to CONTRACTOR written notice thereof and within seven (7) calendar days of commencement of the delay, a written description of the anticipated impact of the delay on performance of the Work. Delays attributable to and within the control of SUBCONTRACTOR'S suppliers or subcontractors of any tier shall be deemed delays within the control of SUBCONTRACTOR. Radiological survey time to release personnel, materials, equipment or facilities from known radiological areas shall not be considered excusable delays. Within seven (7) calendar days after the termination of any excusable delay, SUBCONTRACTOR shall file a written notice with CONTRACTOR specifying the actual duration of the delay. Failure to give any of the above notices shall be sufficient ground for denial of an extension of time. If CONTRACTOR determines that the delay was unforeseeable, beyond the control and without the fault or negligence of SUBCONTRACTOR, CONTRACTOR will determine the duration of the delay and will extend the time of performance of this Subcontract by modifying the Special Condition clause titled "COMMENCEMENT, PROGRESS, AND COMPLETION OF THE WORK," accordingly. Such extension shall be the sole remedy for the delay.

GC 7.25 Cooperation with Others

The CONTRACTOR may undertake or award other Subcontracts for other work or services. CONTRACTOR, OWNER, and other contractors may be working at the Jobsite during the performance of this Subcontract and SUBCONTRACTOR Work or use of certain facilities may be interfered with as a result of such concurrent activities. SUBCONTRACTOR shall fully cooperate with the other subcontractors and with CONTRACTOR employees. CONTRACTOR reserves the right to require SUBCONTRACTOR to schedule the order of performance of the Work to minimize interference with Work of any of the parties involved. The SUBCONTRACTOR shall not commit any act that will interfere with the performance of work by any other subcontractor or by CONTRACTOR employees.

GC 7.26 Use of Completed Portions of Work

- 7.26.1 Whenever, as determined by CONTRACTOR, any portion of the Work performed by SUBCONTRACTOR is suitable for use, CONTRACTOR or OWNER may occupy and use such portion. Use shall not constitute acceptance, relieve SUBCONTRACTOR of its responsibilities, or act as a waiver by CONTRACTOR of any of the terms of the Subcontract.

- 7.26.2 If, as a result of SUBCONTRACTOR'S failure to comply with the provisions of this Subcontract, such use proves to be unsatisfactory to CONTRACTOR or OWNER, CONTRACTOR or OWNER shall have the right to continue such use until such portion of the Work can, without injury to CONTRACTOR or OWNER, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary, for such portion of the Work to comply with the Subcontract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve (12) months unless otherwise mutually agreed in writing between the parties.
- 7.26.3 SUBCONTRACTOR shall not use any permanently installed equipment unless such use is approved in writing by CONTRACTOR. When such use is approved, SUBCONTRACTOR shall at SUBCONTRACTOR'S expense, properly use and maintain and, upon completion of such use, recondition such equipment as required to meet specifications.
- 7.26.4 If CONTRACTOR or OWNER furnishes an operator for such equipment, all services performed shall be under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than payment of such operator's wages, Worker's Compensation Insurance, or other benefits paid directly or indirectly by CONTRACTOR or OWNER.

GC 7.27 Suspension

- 7.27.1 CONTRACTOR may, by written notice to SUBCONTRACTOR, suspend at any time the performance of all or any portion of the Work to be performed under the Subcontract. Upon receipt of such notice, SUBCONTRACTOR shall, unless the notice requires otherwise:
- (a) Immediately discontinue Work on the date and to the extent specified in the notice.
 - (b) Place no further orders or subcontracts for material, services, or facilities with respect to suspended Work other than to the extent required in the notice.
 - (c) Promptly make every reasonable effort to obtain suspension upon terms satisfactory to CONTRACTOR of all orders, subcontracts and rental agreements to the extent they relate to performance of the suspended Work.
 - (d) Continue to protect and maintain the Work, including those portions on which Work has been suspended.
 - (e) Take any other reasonable steps to minimize costs associated with such suspension.
- 7.27.2 As full compensation for such suspension, SUBCONTRACTOR will be reimbursed for the following costs, excluding profit, reasonably incurred, without duplication of any item, to the extent that such costs directly result from such Work suspension:
- (a) A standby charge to be paid to SUBCONTRACTOR during the period of Work suspension, which standby charge shall be sufficient to compensate SUBCONTRACTOR for keeping, to the extent required in the suspension notice, its organization and equipment committed to the Work on a standby basis.
 - (b) All reasonable costs associated with mobilization and demobilization of SUBCONTRACTOR'S plant, forces and equipment.
 - (c) An equitable amount to reimburse SUBCONTRACTOR for the cost of maintaining and protecting that portion of the Work upon which performance has been suspended.
- 7.27.3 Upon receipt of notice to resume suspended Work, SUBCONTRACTOR shall immediately resume performance under this Subcontract to the extent required in the notice.

7.27.4 If the SUBCONTRACTOR intends to assert a claim for equitable adjustment under this clause, it must, within ten (10) calendar days after receipt of notice to resume Work, submit to CONTRACTOR a written statement setting forth the schedule impact and monetary extent of such claim in sufficient detail to permit thorough analysis. No adjustment shall be made for any suspension to the extent that performance would have been suspended, delayed, or interrupted by an SUBCONTRACTOR non-compliance with the requirements of this Subcontract.

GC 7.28 Commercial Activities

Neither SUBCONTRACTOR nor its employees shall establish any commercial activity or issue concessions or permits of any kind to third parties for establishing commercial activities on the Jobsite or any other lands owned or controlled by CONTRACTOR or OWNER.

GC 7.29 Publicity and Advertising

SUBCONTRACTOR shall not make any announcement, take any photographs, or release any information concerning this Subcontract, the Project, or any part thereof to any member of the public, press, business entity, or any official body unless prior written consent is obtained from CONTRACTOR

GC 7.30 Quality Assurance Program

7.30.1 Within thirty (30) calendar days of Subcontract award and in any event prior to commencing Work at any Work Site, SUBCONTRACTOR shall submit a Quality Assurance Program for approval consisting of the following documents:

(a) Quality Assurance Program Manual.

(b) Project Quality Assurance Plan.

7.30.2 The Project-specific Quality Assurance Plan (Plan) shall address all activities relevant to the Work and shall demonstrate how all work performed by SUBCONTRACTOR will conform to the Subcontract requirements. The plan shall be submitted in accordance with Exhibit I and shall contain all elements set forth in the Scope of Work.

7.30.3 The Plan shall define the documented quality system to be applied by SUBCONTRACTOR throughout the Work, in accordance with the requirements of Department of Energy (DOE) Order 414.1C.

7.30.4 The Plan shall address the interfaces between CONTRACTOR, SUBCONTRACTOR, and other relevant organizational entities. The plan shall include an organization chart showing SUBCONTRACTOR'S corporate and Project organization responsible for managing, performing and verifying the Work. The organization chart shall be supported with a reporting and functional description of SUBCONTRACTOR'S Project organization and identification of the quality-related responsibilities of key positions.

7.30.5 The Plan shall be updated as necessary throughout the Subcontract, to reflect any changes to SUBCONTRACTOR'S documented quality system. Revisions to the manual and/or Plan must be submitted to the CONTRACTOR for approval prior to implementation.

7.30.6 SUBCONTRACTOR'S documented quality system shall provide for the issuance of a "stop work" order by the SUBCONTRACTOR or CONTRACTOR at any time during the Work when significant adverse quality trends and/or deviations from the approved Quality Assurance Program are found. CONTRACTOR reserves the right to perform Quality Assurance Audits of SUBCONTRACTOR'S approved Quality Assurance Program, including lower-tier suppliers and subcontractors, at any state of the Work.

GC 7.31 SUBCONTRACTOR Employee Concerns Program

7.31.1 The SUBCONTRACTOR'S Employee Concerns Program shall conform to DOE Order 442.1 Employee Concerns Program. The CONTRACTOR reserves the right to audit the SUBCONTRACTOR'S Employee Concerns Program for compliance and implementation at any time. As directed by CONTRACTOR, the SUBCONTRACTOR shall report and correct any deficiencies as deemed necessary.

7.31.2 As a minimum, SUBCONTRACTOR shall establish an Employee Concerns Program (ECP) that ensures employee concerns related to such issues as the environment, safety, health, and management of SUBCONTRACTOR'S programs and facilities are addressed through:

- (a) prompt identification, reporting and resolution of employee concerns regarding site facilities or operations in a manner that provides the highest degree of safe operations;
- (b) free and open expression of employee concerns that results in an independent, objective evaluation;
- (c) supplementation of existing processes with an independent avenue for reporting concerns;
- (d) employees are encouraged to first seek resolution with the first line supervisors or through existing complaint or dispute resolution systems, but that they have the right to report concerns through the DOE ECP; and
- (e) management's intolerance for reprisals against or intimidation of employees who reported concerns.

As an alternative, SUBCONTRACTOR may use CONTRACTOR'S Employee Concern Program. If this is SUBCONTRACTOR'S choice, SUBCONTRACTOR will so indicate here.

7.31.3 In support of the effective implementation of the Employee Concerns Program, SUBCONTRACTOR is required to:

- (a) assist OWNER and CONTRACTOR in the resolution of employee concerns in a manner that protects the health and safety of both employees and the public and ensures effective and efficient operation of CONTRACTOR-related activities under their jurisdiction;
- (b) ensure that SUBCONTRACTOR and lower-tier Subcontractor employees, vendors/visitors are advised that they have the right and responsibility to report concerns relating to the environment, safety, health, or management of CONTRACTOR-related activities; and
- (c) cooperate with assessments used to verify that they have acted to minimize, correct, or prevent recurrence of the situation that precipitated a valid concern.

7.31.4 The SUBCONTRACTOR is responsible for compliance with the requirements made applicable to this Subcontract regardless if the Work is completed by the SUBCONTRACTOR or its subcontractors at any tier. The SUBCONTRACTOR is responsible for flowing down the necessary provisions in this Subcontract to its subcontractors at any tier.

GC 7.32 Workers Compensation Requirements

Subcontractors will be required to provide workers' compensation in accordance with the statutes of the State of Washington (Title 51, Revised Code of Washington) for performance of work under this Subcontract including work performed by lower-tier subcontractors. SUBCONTRACTOR shall be responsible for making all payments and submitting all reports required by Title 51, Section 51.32.073, and Revised Code of Washington.

GC 7.33 Insurance

Unless otherwise specified in this Subcontract, SUBCONTRACTOR shall, at its sole expense, maintain in effect at all times during the performance of the Work insurance coverage with limits not less than those set forth below with

insurers and under forms of policies satisfactory to CONTRACTOR. SUBCONTRACTOR shall deliver to CONTRACTOR no later than ten (10) calendar days after Subcontract award, but in any event before commencing the Work or entering the Jobsite, certificates of insurance as evidence that policies providing such coverage and limits of insurance are in full force and effect. Certificates shall be issued in the form provided by CONTRACTOR or if none is provided in a form acceptable to CONTRACTOR and provide that not less than thirty (30) calendar days advance written notice will be given to CONTRACTOR prior to cancellation or termination of said policies of insurance. SUBCONTRACTOR agrees to notify CONTRACTOR not less than thirty (30) days prior to any material reduction in coverage. Certificates shall identify on their face the PROJECT NAME and the applicable SUBCONTRACT NUMBER.

7.33.1 Standard Coverage:

- A. If there is an exposure or injury to CONTRACTOR'S employees under the U.S. Longshoremen's and Harbor Worker's Compensation Act, the Jones Act or under laws, regulations, or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.
- B. SUBCONTRACTOR must have Employer's Liability of not less than \$1,000,000 each accident.
- C. General Liability Insurance:

1. Coverage

SUBCONTRACTOR shall carry Commercial General Liability Insurance covering all ongoing and completed operations by or on behalf of SUBCONTRACTOR providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and including coverage for:

- a. Premises and Operations;
- b. Products and Completed Operations
- c. Broad form or Blanket Contractual Liability;
- d. Broad form Property Damage (including Completed Operations);
- e. Explosion, Collapse and Underground Hazards; and
- f. Personal Injury Liability.

The Commercial General Liability insurance shall be written on an Occurrence Coverage Form.

2. Policy Limits

For SUBCONTRACTOR'S Commercial General Liability Insurance, the limits of liability for bodily injury, property damage, and personal injury shall be not less than:

\$2,000,000	Combined single limit for Bodily Injury and Property Damage each occurrence;
\$2,000,000	Personal Injury Limit each occurrence;
\$4,000,000	Products-Completed Operations Annual Aggregate Limit; and
\$4,000,000	General Annual Aggregate Limit (other than Products-Completed Operations).

If the policy does not have an endorsement providing the General Annual Aggregate limits on a per project basis, SUBCONTRACTOR shall provide an endorsement entitled "Amendment of Limits of Insurance (Designated Project or Premises)." Such endorsement shall provide for a Products-Completed Operations Annual Aggregate Limit of not less than \$5,000,000 and a General Annual Aggregate Limit of not less than \$5,000,000. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

3. Additional Insureds.

- a. CONTRACTOR and OWNER and their subsidiaries and affiliates, and the officers, directors and employees of the foregoing shall be named as Additional Insureds under the Commercial General Liability Insurance policy, but only with respect to liability arising out of the operations for CONTRACTOR and OWNER by or for SUBCONTRACTOR. In the United States, Insurance Services Office (ISO) form CG 20 10 and CG 20 37 shall be attached to the policy. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insureds, be primary as regards any other coverage maintained for or by the Additional Insureds, and shall contain a cross-liability or severability of interest clause.
 - b. In lieu of naming CONTRACTOR and OWNER as Additional Insureds under the Commercial General Liability policy, SUBCONTRACTOR may, at CONTRACTOR'S sole discretion and not as an option, provide Owners and Contractors Protective Liability Insurance. If SUBCONTRACTOR purchases Owners and Contractors Protective Liability Insurance for the benefit of OWNER and CONTRACTOR, the policy shall have a combined single limit for Bodily Injury or Property Damage of not less than:

\$2,000,000 Each Occurrence, and
\$2,000,000 Annual Aggregate.
 - c. The Subcontract (the Work) shall be designated in the Policy Declarations and the policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Named Insured.
- D.
- 1. Automobile Liability Insurance, including coverage for the operation of any vehicle, shall include, but be not limited to, owned, hired and non-owned vehicles: The combined single limit for Bodily Injury and Property Damage Liability shall be not less than \$2,000,000 for any one accident or loss. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.
 - 2. SUBCONTRACTOR'S Automobile Liability Insurance shall include coverage for Automobile Contract Liability.
 - 3. The policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Additional Insured. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insured, be primary as regards any other coverage maintained for or by the "Additional Insured's, and shall contain a cross-liability or severability of interest clause.
- E. In the event SUBCONTRACTOR maintains insurance covering loss or damage to equipment, tools, or any other property of SUBCONTRACTOR, such insurance shall include an Insurer's waiver of subrogation in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates.

7.33.2 Special Operations Coverage. Should any of the Work:

- A. 1. Involve marine operations, SUBCONTRACTOR shall provide or have provided coverage for liabilities arising out of such marine operations, including contractual liability under its commercial General Liability Insurance or Marine Hull and Machinery Insurance, and Protection, and indemnity insurance, each with a minimum Limit of Liability of \$5,000,000. In the event such marine operations involve any SUBCONTRACTOR owned, hired, chartered, or operated vessels, barges, tugs or other marine equipment, SUBCONTRACTOR agrees to provide or have provided Marine Hull and Machinery Insurance and Protection and indemnity insurance and/or Charterer's Liability Insurance.

The combined limit of the Protection and Indemnity Insurance and/or Charterer's Liability Insurance shall be no less than the market value of the vessel or \$5,000,000, whichever is greater. The Protection and Indemnity and/or Charterer's liability and Hull and Machinery coverage shall include coverage for contractual liability, wreck removal, tower's liability, if applicable, and full collision coverage, and shall be endorsed:

- a. To provide full coverage to CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured without limiting coverage to liability "as owner of the vessel" and to delete any "as owner" clause or other language that would limit coverage to liability of an insured "as owner of the vessel;" and
- b. To waive limit to full coverage for the Additional Insured provided by any applicable liability statute.

All marine insurances provided by SUBCONTRACTOR shall include an Insurer's waiver of subrogation in favor of the Additional Insured.

2. Involve the hauling of property in excess of \$300,000, SUBCONTRACTOR shall also carry "All Risk" Transit Insurance, or "All Risk" Motor Truck Cargo Insurance, or such similar form of insurance that will insure against physical loss or damage to the property being transported, moved or handled by SUBCONTRACTOR pursuant to the terms of this Subcontract.

Such insurance shall provide a limit of not less than the replacement cost of the highest value being moved, shall insure the interest of SUBCONTRACTOR, CONTRACTOR, OWNER, and the subsidiaries and affiliates of CONTRACTOR and OWNER as their respective interests may appear and shall include an insurer's waiver of subrogation rights in favor of each.

- B. Involve aircraft (fixed or rotary wing) owned, operated, or chartered by the SUBCONTRACTOR, liability arising from such aircraft shall be insured for a combined single limit not less than \$10,000,000 each occurrence, and such limit shall apply to Bodily Injury (including passengers) and Property Damage Liability. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insureds, include an Insurer's waiver of subrogation in favor of the Additional Insureds, state that it is primary insurance as regards the Additional Insureds, and contain a cross-liability or severability of interest clause. If the aircraft hull is insured, such insurance shall provide for an Insurer's waiver of subrogation rights in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates. In the event SUBCONTRACTOR charters aircraft, the foregoing insurance and evidence of insurance may be furnished by the owner of the chartered aircraft, provided the above requirements are met.
- C. Involve investigation, removal, or remedial action concerning the actual or threatened escape of hazardous substances, SUBCONTRACTOR shall also carry Pollution Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. Such insurance shall provide coverage for both sudden and gradual occurrences arising from the Work performed under this Subcontract. If Completed Operations is limited in the policy, such Completed Operation Coverage shall be for a period of not less than five (5) years. Such insurance shall include a three (3)-year extended discovery period and shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.
- D. Involve inspection, handling, or removal of asbestos, SUBCONTRACTOR shall also carry Asbestos Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. The policy shall be written on an "Occurrence Basis" with no sunset clause. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.

- E. Involve transporting hazardous substances, SUBCONTRACTOR shall also carry Business Automobile Insurance covering liability arising from transportation of hazardous materials in an amount not less than \$2,000,000 per occurrence. Such policy shall include Motor Carrier Endorsement MCS-90. NEITHER CONTRACTOR NOR OWNER IS TO BE NAMED AN ADDITIONAL INSURED FOR THIS POLICY.
- F. Involve treatment, storage, or disposal of hazardous wastes, SUBCONTRACTOR shall furnish an insurance certificate from the designated disposal facility establishing that the facility operator maintains current Environmental Liability Insurance in the amount of not less than \$5,000,000 per occurrence/annual aggregate.

7.33.3 Related Obligations

- A. The requirements contained herein as to types and limits, as well as CONTRACTOR'S approval of insurance coverage to be maintained by SUBCONTRACTOR, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by SUBCONTRACTOR under this Subcontract.
- B. The Certificates of Insurance must provide clear evidence that SUBCONTRACTOR'S Insurance Policies contain the minimum limits of coverage and the special provisions prescribed in this clause.

7.33.4 CONTRACTOR or OWNER-Furnished Insurance:

Neither CONTRACTOR nor OWNER is maintaining any insurance on behalf of SUBCONTRACTOR covering against loss or damage to the Work or to any other property of SUBCONTRACTOR unless otherwise specifically stated herein and as may be described by appendix hereto.

7.33.5 Notifications:

In accordance with the submittal requirements outlined above, SUBCONTRACTOR shall deliver the original and two (2) copies of the Certificate of Insurance required by this clause and all subsequent notices of cancellation, termination, and alteration of such policies to:

Washington Closure Hanford LLC (WCH)
2620 Fermi Avenue
Richland, WA 99354
Attention: Dana Looney Mail Stop: H4-17
Subcontract No: S013213A00

8.0 THE CONTRACTOR

GC 8.1 Authorized Representatives

Before starting Work, SUBCONTRACTOR shall designate in writing an authorized representative acceptable to CONTRACTOR to represent and act for SUBCONTRACTOR and shall specify any and all limitations of such representative's authority. Such representative shall be present or be represented at the Jobsite at all times when Work is in progress, and shall be empowered to receive communications in accordance with this Subcontract on behalf of SUBCONTRACTOR. During periods when the Work is suspended, arrangements shall be made for an authorized representative acceptable to CONTRACTOR for any emergency Work that may be required. All communications given to the authorized representative by CONTRACTOR in accordance with this Subcontract shall be binding upon SUBCONTRACTOR. CONTRACTOR shall designate, in writing, one or more representatives to represent and act for CONTRACTOR and to receive communications from SUBCONTRACTOR. Notification of changes of authorized representatives for either CONTRACTOR or SUBCONTRACTOR shall be provided in advance, in writing, to the other party.

GC 8.2 Medical Examinations

- 8.2.1 CONTRACTOR shall provide all occupational medical requirements including physical examinations through the Hanford Site Occupational Medicine Provider. Subcontractors shall contact the Subcontract Technical Representative to coordinate access to site medical services. All time spent by SUBCONTRACTOR'S employees and transportation costs for medical examinations shall be at the expense of the SUBCONTRACTOR.
- 8.2.2 The SUBCONTRACTOR shall endeavor to employ only those persons who are physically qualified to perform work to which they are assigned at the jobsite with or without reasonable accommodation. If the SUBCONTRACTOR or CONTRACTOR determines that there may be a question of the person's physical fitness to safely perform work to be assigned, the SUBCONTRACTOR shall, with the approval of CONTRACTOR, require such employee to undergo a medical examination.
- 8.2.3 In any case where it is determined that a SUBCONTRACTOR employee is physically unable to perform the essential duties of the job, with or without reasonable accommodation, CONTRACTOR reserves the right to determine whether or not the employee may be assigned to work at the Jobsite and to determine any work assignment limitations to be imposed, and the SUBCONTRACTOR shall be responsible for enforcing CONTRACTOR'S decision.
- 8.2.4 The Hanford Site medical services provider at the discretion of the CONTRACTOR may review medical records.

GC 8.3 First Aid Facilities

Where CONTRACTOR or OWNER have first aid facilities at the Jobsite they may, at their option, make available their first aid facilities to treat employees of SUBCONTRACTOR who may be injured or become ill while performing the Work under this subcontract. If first aid facilities and/or services are made available to SUBCONTRACTOR'S employees, then, in consideration for the use of such facilities and the receipt of such services, SUBCONTRACTOR hereby agrees:

- (a) To release, defend, indemnify, and hold harmless CONTRACTOR, OWNER, and their authorized representatives, successors or assigns, and all of their officers and employees from and against any and all claims, demands, liabilities, including attorney's fees, arising from the receipt of such services or the use of such facilities by SUBCONTRACTOR'S employees, except for claims and demands arising out of the sole active negligence of CONTRACTOR, OWNER, or any of their representatives.
- (b) Upon receipt of any notice from CONTRACTOR or OWNER of any such claim, demand, or liability being pursued against CONTRACTOR or OWNER, to not only undertake the defense of such claim, demand or liability, but also upon entry of judgment, to make any and all payments necessary thereunder.
- (c) If any of SUBCONTRACTOR'S employees require off-site medical services, including transportation thereto, SUBCONTRACTOR shall promptly pay for such services directly to the providers thereof.

GC 8.4 Notices

Any notices provided for hereunder shall be in writing and may be served either personally on the authorized representative of the receiving party at the Jobsite or by registered mail to the address of that party, as shown on the face of the Subcontract Agreement Form or as such address may have been changed by written notice.

GC 8.5 Changes

- 8.5.1 CONTRACTOR may, at any time, without notice to the sureties, by written Change Notice, unilaterally make any change in the Work within the general scope of this Subcontract, including, but not limited to, changes:
- (a) In the drawings, designs, or specifications.

- (b) In the method, manner, or sequence of SUBCONTRACTOR Work.
- (c) In OWNER or CONTRACTOR-furnished facilities, equipment, materials, services, or site(s).
- (d) Directing acceleration or deceleration in the performance of the Work.
- (e) Modifying the Subcontract Schedule or the Subcontract Milestones.

- 8.5.2 All other changes to this Subcontract outside the scope of work shall be by written Modification signed by both parties
- 8.5.3 If an emergency occurs that endangers life or property, CONTRACTOR may use oral orders to SUBCONTRACTOR for any work required by reason of such emergency. SUBCONTRACTOR shall commence and complete such emergency work, as directed by CONTRACTOR. Such orders will be confirmed by Change Notice..
- 8.5.4 If at any time SUBCONTRACTOR believes that acts or omissions of CONTRACTOR or OWNER constitute a change to the Work not covered by a Change Notice, SUBCONTRACTOR shall within ten (10) calendar days of discovery of such act or omission submit a written Change Notice Request explaining, in detail, the basis for the request. CONTRACTOR will either issue a Change Notice or deny the request in writing.
- 8.5.5 If any change under this clause directly or indirectly causes an increase or decrease in cost of, or the time required for, the performance of any part of the Work under this Subcontract, whether or not changed by any order, an equitable adjustment shall be made and the Subcontract modified accordingly. However, SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors for increased costs in connection with any changes or delays in the Work for claims arising in tort (including negligence), or in contract except as specifically provided in this Subcontract.
- 8.5.6 If the SUBCONTRACTOR intends to assert a claim for an equitable adjustment under this clause, it must, within (10) calendar days after receipt of a Change Notice provide written notification of such intent and within a further twenty (20) calendar days, pursuant to the Special Condition clause titled "PRICING ADJUSTMENTS," submit to CONTRACTOR a written proposal in sufficient detail to permit thorough analysis and negotiation.
- 8.5.7 To facilitate prompt resolution, Requests for Equitable Adjustments, require a full and complete submittal of factual causes, contractual bases, quantified impacts, documentary evidence, and proposed resolutions from the Subcontractor. Submittals should address the following:
- (a) A description of the work performed, delayed, or impacted.
 - (b) Quantified cost and schedule impacts.
 - (c) A description of the contractual bases for entitlement.
 - (d) A description of the requested relief.
- 8.5.8 Any delay by SUBCONTRACTOR in giving notice or presenting a proposal for adjustment under this clause shall be grounds for rejection of the claim if and to the extent CONTRACTOR or OWNER are prejudiced by such delay. In no case shall a claim by SUBCONTRACTOR be considered if asserted after final payment under this Subcontract.
- 8.5.9 Failure by CONTRACTOR and SUBCONTRACTOR to agree on any adjustment shall be a dispute within the meaning of the General Condition clause titled "DISPUTES." However, SUBCONTRACTOR shall proceed diligently with performance of the work, as changed, pending final resolution of any request for relief, dispute, claim appeal, or action arising under the Subcontract and comply with any decision of CONTRACTOR.

GC 8.6 Final Inspection and Acceptance

- 8.6.1 When SUBCONTRACTOR considers the Work, or any CONTRACTOR-identified independent portion of the Work, under this Subcontract to be complete and ready for acceptance, SUBCONTRACTOR shall notify CONTRACTOR in writing. CONTRACTOR, with SUBCONTRACTOR'S cooperation, will

conduct such reviews, inspections, and tests as may be reasonably required to satisfy CONTRACTOR that the Work, or identified portion of the Work, conforms to all requirements of the Subcontract. If all or any part of the Work covered by SUBCONTRACTOR'S notice does not conform to Subcontract requirements, CONTRACTOR shall notify SUBCONTRACTOR of such nonconformance and SUBCONTRACTOR shall take corrective action and then have the nonconforming work re-inspected until all Subcontract requirements are satisfied.

8.6.2 CONTRACTOR shall issue a Notice of Provisional Acceptance for individual portions that have been satisfactorily inspected, subject only to CONTRACTOR'S Final Acceptance of the Work as a whole.

8.6.3 CONTRACTOR'S written Notice of Final Acceptance of the Work under this Subcontract shall be final and conclusive, except with regard to latent defects, fraud, or such gross mistakes as amount to fraud, or with regard to CONTRACTOR'S and OWNER'S rights under the General Condition clause titled "WARRANTY."

GC 8.7 Emergency Situation

The OWNER or designee shall have sole discretion to determine when an emergency situation exists at the Hanford Site, except for the DOE Office of River Protection Project facilities, affecting site personnel, the public health, safety, the environment, or security. The Manager, Office of River Protection (ORP), or designee has the discretion to determine whether an emergency situation exists under other ORP contract areas of work that might affect RL workers. In the event that either the RL or ORP Manager or designee determines such an emergency exists, the RL Manager or designee will have the authority to direct any and all activities of the Subcontractor and lower tier subcontractors necessary to resolve the emergency situation. The RL Manager or designee may direct the activities of the Subcontractor and lower subcontractors throughout the duration of the emergency. The Subcontractor shall include this clause in all lower-tier subcontracts for work performed at the Hanford Site.

9.0 GENERAL SUBCONTRACT PROVISIONS

GC 9.1 Applicable Law

Irrespective of the place of performance, the provisions in this Order that adopt or adapt Federal Government Acquisition Regulations (FAR) shall be construed and interpreted according to the federal common law of government contracts as enunciated and applied by federal judicial bodies, boards of contracts appeals, and quasi-judicial agencies of the federal government. To the extent that the federal common law of government contracts is not dispositive, the laws of the State of Washington shall apply.

GC 9.2 Words and Phrases

9.2.1 Where the words "as shown," or words of like import are used in this Subcontract, reference is to the drawings listed in this Subcontract unless the context clearly indicates a different meaning. Where the words "required," "approved," "satisfactory," "determined," "acceptable" or words of like import are used in this Subcontract, action by CONTRACTOR is indicated unless the context clearly indicates otherwise, and all the Work shall be in accordance therewith.

9.2.2 A requirement that a SUBCONTRACTOR-furnished document is to be submitted for or subject to "Authorization to Proceed," "Approval," "Acceptance," "Review," "Comment," or any combinations of such words or words of like import shall mean unless the context clearly indicates otherwise, that SUBCONTRACTOR shall, before implementing the information in the document, submit the document, obtain resolution of any comments and authorization to proceed. Such review shall not mean that a complete check will be performed. Authorization to proceed shall not constitute acceptance or approval of design details, calculations, analyses, tests, construction methods, or materials developed or selected by SUBCONTRACTOR and shall not relieve SUBCONTRACTOR from full compliance with requirements of the Subcontract.

9.2.3 Such action, or failure to act, shall not relieve SUBCONTRACTOR of its contractual responsibilities for performance of this Subcontract. Wherever in this Subcontract it is provided that SUBCONTRACTOR

shall perform certain Work "at its expense" or "without charge" or that certain Work "will not be paid for separately," such quoted words mean that SUBCONTRACTOR shall not be entitled to any additional compensation from CONTRACTOR for such Work, and the cost thereof shall, unless otherwise specified, be considered as included in the payment for other items of the Work.

GC 9.3 Taxes

- 9.3.1 SUBCONTRACTOR shall pay all taxes, levies, duties, and assessments of every nature in connection with the Work under this Subcontract and shall make any and all payroll deductions required by law, and hereby indemnifies and holds harmless CONTRACTOR and OWNER from any liability on account of any and all such taxes, levies, duties, assessments, and deductions.
- 9.3.2 CONTRACTOR recognizes that the tax classification established by Revised Code of Washington (RCW) 82.04.263 (currently taxed at the rate of 0.471 percent) may be applicable to the performance of all work under this Subcontract.
- 9.3.3 Subcontractor will include the above language related to Washington State B&O Tax in all sub-tier subcontracts and purchase orders.

GC 9.4 Backcharges

- 9.4.1 If, under the provisions of this Subcontract, SUBCONTRACTOR is notified by CONTRACTOR to correct defective or nonconforming Work, and SUBCONTRACTOR states or by its actions indicates that it is unable or unwilling to proceed with corrective action in a reasonable time, CONTRACTOR may, upon written notice, proceed to accomplish the redesign, repair, rework, or replacement of nonconforming Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred. Furthermore, if CONTRACTOR agrees to or is required to perform Work for SUBCONTRACTOR, such as cleanup, off-loading, or completion of incomplete Work, CONTRACTOR may, upon written notice, perform such Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred.
- 9.4.2 The cost of backcharge Work shall include:
 - (a) Incurred labor costs, including all payroll additives.
 - (b) Incurred net delivered material costs.
 - (c) Incurred lower-tier supplier and subcontractor costs directly related to performing the corrective action.
 - (d) Equipment and tool rentals at prevailing rates in the Jobsite area.
 - (e) A factor of sixty percent (60%) applied to the total of items (a) through (d) for CONTRACTOR'S overhead, supervision, and administrative costs.
- 9.4.3 The backcharge notice will request SUBCONTRACTOR'S approval for CONTRACTOR to proceed with the required Work. However, failure of SUBCONTRACTOR to grant such approval shall not impair CONTRACTOR'S right to proceed with Work under this or any other provision of this Subcontract.
- 9.4.4 CONTRACTOR shall separately invoice or deduct from payments otherwise due to SUBCONTRACTOR the costs, as provided herein. CONTRACTOR'S right to backcharge is in addition to any and all other rights and remedies provided in this Subcontract or by law. The performance of backcharge Work by CONTRACTOR shall not relieve SUBCONTRACTOR of any of its responsibilities under this Subcontract, including, but not limited to, express or implied warranties, specified standards for quality, contractual liabilities and indemnifications, and the Subcontract Schedule.

GC 9.5 Examination of SUBCONTRACTOR's Record's and Accounts

SUBCONTRACTOR shall maintain a separate and distinct set of accounts and records in accordance with the General Condition entitled "DEAR 970.5232-3, Accounts, Records and Inspections (DEC 2000)." Inspection, copying, auditing and retention of such records shall be in accordance with the above General Condition and the General Condition entitled "DEAR 970.5204-3, Access To and Ownership of Records (DEC 2000)."

GC 9.6 Title to Materials Found

The title to water, soil, rock, gravel, sand, minerals, timber, and any other materials developed or obtained in the excavation or other operations of SUBCONTRACTOR or any of its lower-tier subcontractors and the right to use said materials or dispose of same is hereby expressly reserved by OWNER. Neither SUBCONTRACTOR, its lower-tier subcontractors, nor any of their representatives or employees shall have any right, title, or interest in said materials, nor shall they assert or make any claim thereto. SUBCONTRACTOR may, at the sole discretion of OWNER, be permitted, without charge, to use in the Work any such materials that meet the requirements of this Subcontract.

GC 9.7 Termination for Default

- 9.7.1 Notwithstanding any other provisions of this Subcontract, SUBCONTRACTOR shall be considered in default of its contractual obligations under this Subcontract if SUBCONTRACTOR:
- (a) Performs work that fails to conform to the requirements of this Subcontract.
 - (b) Fails to make progress so as to endanger performance of this Subcontract.
 - (c) Abandons or refuses to proceed with any of the Work, including modifications directed pursuant to the General Condition clause titled "CHANGES."
 - (d) Fails to fulfill or comply with any of the terms of this Subcontract.
 - (e) Engages in behavior that is dishonest, fraudulent, or constitutes a conflict of interest with SUBCONTRACTOR'S obligations under this Subcontract.
 - (f) Becomes insolvent or makes a general assignment for the benefit of creditors or reasonable grounds for insecurity arise with respect to SUBCONTRACTOR'S performance.
 - (g) Fails to correct an unsafe condition or noncompliance or demonstrates a persistent pattern of poor safety performance.
- 9.7.2 Upon the occurrence of any of the foregoing, CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the nature of the failure and of CONTRACTOR'S intention to terminate the Subcontract for default. If SUBCONTRACTOR does not cure such failure within seven (7) calendar days from receipt of notification, or sooner if safety to persons is involved, or fails to provide satisfactory evidence that such default will be corrected within a reasonable time, CONTRACTOR may, by written notice to SUBCONTRACTOR and without notice to SUBCONTRACTOR'S sureties, if any, terminate in whole or in part SUBCONTRACTOR'S right to proceed with the Work and CONTRACTOR may prosecute the Work to completion by contract or by any other method deemed expedient. CONTRACTOR may take possession of and utilize any data, designs, licenses, equipment, materials, plant, tools, and property of any kind furnished by SUBCONTRACTOR and necessary to complete the Work.
- 9.7.3 SUBCONTRACTOR and its sureties, if any, shall be liable for all costs in excess of the Subcontract price for such terminated work reasonably and necessarily incurred in the completion of the Work as scheduled, including cost of administration of any purchase order or subcontract awarded to others for completion.

9.7.4 Upon termination for default, SUBCONTRACTOR shall:

- (a) Immediately discontinue work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts to the extent that they relate to the performance of the terminated work.
- (b) Inventory, maintain, and turn over to the CONTRACTOR all data, designs, licenses, equipment, materials, plant, tools, and property furnished by SUBCONTRACTOR or provided by CONTRACTOR for performance of the terminated work.
- (c) Promptly obtain cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for performance of the terminated work or assign those agreements as directed by CONTRACTOR.
- (d) Cooperate with the CONTRACTOR in transfer of data, designs, licenses, and information and disposition of work in progress so as to mitigate damages.
- (e) Comply with other reasonable requests from CONTRACTOR regarding the terminated work.
- (f) Continue to perform in accordance with all of the terms and conditions of this Subcontract of such portion of the Work that is not terminated.

9.7.5 If, after termination pursuant to this clause, it is determined for any reason that SUBCONTRACTOR was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to the General Condition clause titled "TERMINATION FOR CONVENIENCE."

GC 9.8 Termination for Convenience

9.8.1 CONTRACTOR may, at its option, terminate for convenience any of the Work under this Subcontract in whole or, from time to time, in part, at any time by written notice to SUBCONTRACTOR. Such notice shall specify the extent to which the performance of the Work is terminated and the effective date of such termination. Upon receipt of such notice SUBCONTRACTOR shall:

- (a) Immediately discontinue the Work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts for materials, services, or facilities, other than as may be required for completion of such portion of the Work that is not terminated.
- (b) Promptly obtain assignment or cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for the performance of the terminated work or assign those agreements directed by CONTRACTOR.
- (c) Assist CONTRACTOR in the maintenance, protection, and disposition of work in progress, plant, tools, equipment, property, and materials acquired by SUBCONTRACTOR or furnished by CONTRACTOR under this Subcontract.
- (d) Complete performance of such portion of the Work that is not terminated.

9.8.2 Upon any such termination, SUBCONTRACTOR shall waive any claims for damages, including loss of anticipated profits; on account thereof, but as the sole right and remedy of SUBCONTRACTOR, CONTRACTOR shall pay in accordance with the following:

- (a) The subcontract price corresponding to the work performed in accordance with this Subcontract before such notice of termination.
- (b) All reasonable costs for work thereafter performed, as specified in such notice.
- (c) Reasonable administrative costs of settling and paying claims arising from terminating work under purchase orders or subcontracts.

(d) Reasonable costs incurred in demobilization and the disposition of residual material, plant, and equipment.

(e) A reasonable overhead and profit on items (a) through (d) of this clause.

9.8.3 SUBCONTRACTOR shall submit within thirty (30) calendar days after receipt of notice of termination, a written statement setting forth its proposal for an adjustment to the subcontract price to include only the incurred costs described in this clause. CONTRACTOR shall review, analyze, and verify such proposal, and negotiate an equitable adjustment, and the Subcontract shall be modified accordingly.

GC 9.9 Non-Waiver

Failure by CONTRACTOR to insist upon strict performance of any terms or conditions of this Subcontract, or failure or delay to exercise any rights or remedies provided herein or by law, or failure to properly notify SUBCONTRACTOR in the event of breach, or the acceptance of or payment for any goods or services hereunder, or the review or failure to review designs shall not release SUBCONTRACTOR from any of the warranties or obligations of this Subcontract and shall not be deemed a waiver of any right of CONTRACTOR or OWNER to insist upon strict performance hereof or any of its rights or remedies as to any prior or subsequent default hereunder, nor shall any termination of Work under this Subcontract by CONTRACTOR operate as a waiver of any of the terms hereof.

GC 9.10 Indemnity, Fines and Penalties

9.10.1 SUBCONTRACTOR hereby releases and shall indemnify, defend, and hold harmless CONTRACTOR, OWNER, and their subsidiaries and affiliates and the officers, agents, employees, successors and assigns and authorized representatives of all the foregoing from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs and expenses of whatsoever kind or nature, in connection with or incidental to the performance of this subcontract, whether arising before or after completion of the Work hereunder and in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part, or claimed to be caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of SUBCONTRACTOR, its lower-tier suppliers, subcontractors or of anyone acting under its direction or control or on its behalf in connection with or incidental to the performance of this Subcontract. SUBCONTRACTOR'S aforesaid release, indemnity, and hold harmless obligations, or portions or applications thereof, shall apply to the extent of its negligence or fault and to the fullest extent permitted by law.

9.10.2 The foregoing shall include, but is not limited to, indemnity for:

- (a) Property damage and injury to or death of any person, including employees of CONTRACTOR, OWNER or SUBCONTRACTOR.
- (b) The breach by SUBCONTRACTOR of any representation, warranty, covenant, or performance obligation of this subcontract.
- (c) Events which are directly or indirectly caused by or incident to the radioactive, toxic and/or hazardous properties of any substances.
- (d) Events which arise out of any state or federal statute relating to radioactive, toxic and/or hazardous properties, such as the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) or Resource Conservation and Recovery Act of 1976 (RCRA), and shall apply to any clean-up or response costs occasioned by the transport, treatment, storage or disposal by SUBCONTRACTOR or any third party of radioactive, toxic and/or hazardous properties.

9.10.3 SUBCONTRACTOR specifically waives any immunity provided against this indemnity by an industrial insurance or workers' compensation statute.

9.10.4 SUBCONTRACTOR is liable to CONTRACTOR for fines and penalties assessed by any governmental entity against CONTRACTOR or OWNER as a result of SUBCONTRACTOR'S performance or lack of performance. SUBCONTRACTOR shall indemnify and hold harmless CONTRACTOR and OWNER from and against any and all claims, demands, actions, causes of action, suits, damages, expenses, including attorney's fees, and liabilities whatsoever resulting from or arising in any manner on account of the assessment of said fines and penalties against CONTRACTOR or OWNER.

GC 9.11 Patent and Intellectual Property Indemnity

9.11.1 In addition to FAR 52.227-4, Patent Indemnity-Construction Contracts (APR 1984), SUBCONTRACTOR hereby indemnifies and shall defend and hold harmless CONTRACTOR, OWNER, and their representatives from and against any and all claims, actions, losses, damages, and expenses, including attorney's fees, arising from any claim, whether rightful or otherwise, that any concept, product, design, equipment, material, process, copyrighted material or confidential information, or any part thereof, furnished by SUBCONTRACTOR under this Subcontract constitutes an infringement of any patent or copyrighted material or a theft of trade secrets. If use of any part of such concept, product, design, equipment, material, process, copyrighted material or confidential information is limited or prohibited, SUBCONTRACTOR shall, at its sole expense, procure the necessary licenses to use the infringing or a modified by non-infringing concept, product, design, equipment, material, process, copyrighted material or confidential information or, with CONTRACTOR'S OR OWNER'S prior written approval, replace it with substantially equal but non-infringing concepts, products, designs, equipment, materials, processes, copyrighted material or confidential information; provided, however,

(a) That any such substituted or modified concepts, products, designs, equipment, material, processes, copyrighted material, or confidential information shall meet all the requirements and be subject to all the provisions of this Subcontract.

(b) That such replacement or modification shall not modify or relieve SUBCONTRACTOR of its obligations under this Subcontract.

9.11.2 The foregoing obligation shall not apply to any concept, product, design, equipment, material, process, copyrighted material, or confidential information the detailed design of which (excluding rating and/or performance specifications) has been furnished in writing by CONTRACTOR or OWNER to SUBCONTRACTOR.

GC 9.12 Assignments and Subcontracts

9.12.1 Any assignment of this Subcontract or rights hereunder, in whole or part, without the prior written consent of CONTRACTOR shall be void, except that upon ten (10) calendar days written notice to CONTRACTOR, SUBCONTRACTOR may assign monies due or to become due under this Subcontract, provided that any assignment of monies shall be subject to proper set-offs in favor of CONTRACTOR and any deductions provided for in this Subcontract.

9.12.2 SUBCONTRACTOR shall not subcontract with any third party for the performance of all or any portion of the Work without the advance written approval of CONTRACTOR. Lower-tier subcontracts and purchase orders must include provisions to secure all rights and remedies of CONTRACTOR and OWNER provided under this Subcontract, and must impose upon the lower-tier supplier and subcontractor all of the general duties and obligations required to fulfill this Subcontract.

9.12.3 Copies of all purchase and subcontract agreements are to be provided to CONTRACTOR upon request. Pricing may be deleted unless the compensation to be paid thereunder is reimbursable under this Subcontract.

9.12.4 No assignment or subcontract will be approved that would relieve SUBCONTRACTOR or its sureties, if any, of their responsibilities under this Subcontract.

GC 9.13 Survival

The rights and obligations of the parties that by their nature survive termination or completion of this Subcontract, including, but not limited to, those set forth in the General Conditions titled "WARRANTY" and "INDEMNITY," shall remain in full force and effect.

GC 9.14 Disputes

- 9.14.1 SUBCONTRACTOR shall proceed diligently with performance of the Work, pending final resolution of any request for relief, dispute, claim, appeal, or action arising under the Subcontract, and comply with any decision of CONTRACTOR. SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors in tort (including negligence), or contract except as specifically provided in this Subcontract.
- 9.14.2 Any claim for an adjustment to the Subcontract price or time of performance which cannot be resolved by negotiation shall be considered a dispute within the meaning of this clause.
- 9.14.3 If for any reason SUBCONTRACTOR and CONTRACTOR are unable to resolve a claim for an adjustment, SUBCONTRACTOR or CONTRACTOR shall notify the other party in writing that a dispute exists and request or provide a final determination by CONTRACTOR. Any such request by SUBCONTRACTOR shall be clearly identified by reference to this clause and shall summarize the facts in dispute and SUBCONTRACTOR'S proposal for resolution.
- 9.14.4 If CONTRACTOR'S final determination is not accepted by SUBCONTRACTOR the matter shall, within thirty (30) calendar days, be referred to senior executives of the parties who shall have designated authority to settle the dispute. The parties shall promptly prepare and exchange memoranda stating the issues in dispute and their respective positions, summarizing the negotiations that have taken place and attaching relevant documents.
- 9.14.5 The senior executives will meet for negotiations at a mutually agreed time and place. If the matter has not been resolved within thirty (30) calendar days of the commencement of such negotiations, the parties agree to consider resolution of the dispute through some form of Alternative Dispute Resolution (ADR) process that is mutually acceptable to the parties.
- 9.14.6 Should the parties agree to pursue an ADR process, each party will be responsible for its own expenses incurred to resolve the dispute during the ADR process.
- 9.14.7 If the parties do not agree to an ADR process or are unable to resolve the dispute through ADR, either party shall then have the right to pursue any legal remedy.

GC 9.15 Nondisclosure

- 9.15.1 SUBCONTRACTOR agrees not to divulge to third parties, without the written consent of CONTRACTOR or OWNER, any information obtained from or through CONTRACTOR or OWNER in connection with the performance of this Subcontract unless:
- (a) The information is known to SUBCONTRACTOR before obtaining the same from CONTRACTOR or OWNER;
 - (b) The information is, at the time of disclosure by SUBCONTRACTOR, then in the public domain; or
 - (c) The information is obtained by SUBCONTRACTOR from a third party who did not receive same, directly or indirectly, from CONTRACTOR or OWNER and who has no obligation of secrecy with respect thereto.
- 9.15.2 SUBCONTRACTOR further agrees that it will not, without the prior written consent of CONTRACTOR or OWNER, disclose to any third party any information developed or obtained by SUBCONTRACTOR

in the performance of this Subcontract except to the extent that such information falls within one of the categories described in (a), (b), or (c) above.

- 9.15.3 If so requested by CONTRACTOR or OWNER, SUBCONTRACTOR further agrees to require its employees to execute a nondisclosure agreement before performing any Work under this Subcontract.

GC 9.16 Procurement Integrity

- 9.16.1 The SUBCONTRACTOR warrants that it is familiar with and will comply with all the requirements of Section 27 of the Office of Federal Procurement Policy Act of 1988 (41 U.S.C. §423), as implemented in the Federal Acquisition Regulations (referred to in this clause as "the Act"), including, but not limited to (1) prohibitions on giving or offering future employment, money, or anything of value to a procurement official, (2) prohibitions on soliciting or obtaining from an agency, prior to award, any proprietary or source selection information regarding the procurement, and (3) limits on participation of former government employees and officials in negotiation and performance of government contracts. For a violation of the Act, the Government may reduce the fee or profit on the contract, terminate all or a portion of the contract for default, suspend or debar the contractor from future Federal Government work, impose fines or imprisonment, or pursue other legal remedies.
- 9.16.2 In addition to any other remedies provided by law or herein, the SUBCONTRACTOR agrees to indemnify and hold CONTRACTOR harmless to the full extent of any loss (including any reduction in fee or profit), damages, or expenses (including attorney's fees) if any of the SUBCONTRACTOR'S actions, acting alone or in concert with any other person or entity, cause the government to enforce the provisions of the Act or related regulations against CONTRACTOR.
- 9.16.3 The SUBCONTRACTOR agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all lower-tier subcontracts in amounts exceeding \$100,000.00.

GC 9.17 Rights in Data

When design and/or data is furnished under this Subcontract, FAR 52.227-14 applies.

GC 9.18 Continuity of Service

- 9.18.1 The SUBCONTRACTOR recognizes that the services performed under this Subcontract are vital to the OWNER and must be continued without interruption, and that, upon expiration of the Prime Contract between the OWNER and the CONTRACTOR, a successor, either the Government or another Contractor, may continue to require that the services be performed. The CONTRACTOR shall provide a sixty (60) day written notice to the SUBCONTRACTOR once the successor has been named. The SUBCONTRACTOR shall work with the OWNER and the CONTRACTOR to ensure an efficient transfer to the successor is made.
- 9.18.2 CONTRACTOR may assign this Subcontract to the OWNER or to such party as OWNER may designate to perform CONTRACTOR'S obligations hereunder. Upon receipt by SUBCONTRACTOR of written notice that the OWNER or a party so designated by the OWNER has accepted an assignment of this Subcontract, CONTRACTOR shall be relieved of all responsibility hereunder and SUBCONTRACTOR shall thereafter look solely to such assignee for performance of CONTRACTOR'S obligations.

GC 9.19 Government Flowdowns

The Federal Acquisition Regulation (FAR), the Department of Energy (DOE) FAR Supplement (DEAR) clauses, and the DOE Procurement Regulations incorporated herein shall have the same force and effect as if printed in full text. Upon request, CONTRACTOR will make their full text available. Wherever necessary to make the context of the FAR and DEAR clauses applicable to this Subcontract, the term "Contractor" shall mean "SUBCONTRACTOR," the term "Contract" shall mean this Subcontract, and the term "Government," Contracting Officer" and equivalent phrases shall mean the CONTRACTOR'S representative, except the terms "Government" and Contracting Officer"

do not change: (1) in the phrases "Government Property," "Government-Furnished Property," and "Government-Owned Property"; (2) in the patent clauses incorporated herein; (3) when a right, act, authorization or obligation can be granted or performed only by the Government's duly authorized representative; (4) when title to property is to be transferred directly to the Government; (5) when access to proprietary financial information or other proprietary data is required except for authorized audit rights; and (6) where specifically modified herein.

9.19.1 Applicable to All Subcontracts

CLAUSE	TITLE
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)
52.223-3	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997) – ALT 1 (JUL 1995)
522.22	PRIVACY ACT NOTIFICATION (APR 1984)
52.224-2	PRIVACY ACT (APR 1984)
52.225-11	BUY AMERICAN ACT – CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS AND NORTH AMERICAN FREE TRADE AGREEMENT (JUN 1997)
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (DEC 2003)
52.227-4	PATENT INDEMNITY-CONSTRUCTION CONTRACTS (APR 1984)
52.242-13	BANKRUPTCY (JUL 1995)
52-244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS (JUL 2004)
952.203-70	WHISTLEBLOWER PROTECTION FOR CONTRACTOR EMPLOYEES (DEC 2000)
952.204-2	SECURITY (MAY 2002)
952.208-70	PRINTING (APR 1984)
952.217-70	ACQUISITION OF REAL PROPERTY (APR 1984)
952.227-82	RIGHTS TO PROPOSAL DATA (APR 1994)
970.5223-4	WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (DEC 2000)
970-5232-3	ACCOUNTS, RECORDS, AND INSPECTION (DEC 2000)
CRD M 442.1-1	DIFFERING PROFESSIONAL OPINIONS MANUAL FOR TECHNICAL ISSUES INVOLVING ENVIRONMENT, SAFETY AND HEALTH
CRD O 450.1A	ENVIRONMENTAL PROTECTION PROGRAM

9.19.2 Applicable to Subcontracts over \$2,000 Where the Davis-Bacon Act Applies

CLAUSE	TITLE
52.222-6	DAVIS-BACON ACT (FEB 1995)
52.222-7	WITHHOLDING OF FUNDS (FEB 1988)
52.222-8	PAYROLLS AND BASIC RECORDS (NOV 2009)
52.222-9	APPRENTICES AND TRAINEES (FEB 1988)
52.222-10	COMPLIANCE WITH COPELAND REGULATIONS (FEB 1988)
52.222-11	SUBCONTRACTS LABOR STANDARDS (FEB 1988)
52.222-12	CONTRACT TERMINATION-DEBARMENT (FEB 1988)
52.222-13	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
52.222-14	DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
52.222-15	CERTIFICATION OF ELIGIBILITY (FEB 1988)
52.222-16	APPROVAL OF WAGE RATES (FEB 1988)
53.222(e)	APPLICATION OF LABOR LAWS TO GOVERNMENT ACQUISITIONS
952.222-39	NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES (DEC 2004)

CLAUSE	TITLE
970.5223-1	INTEGRATION OF ENVIRONMENT, SAFETY AND HEALTH INTO WORK PLANNING AND EXECUTION

9.19.3 Applicable to Subcontracts over \$2,500

CLAUSE	TITLE
52.222-3	CONVICT LABOR (JUN 2003)

9.19.4 Applicable to Subcontracts over \$2,500 Where the Service Contract Act Applies

CLAUSE	TITLE
52.222-41	SERVICE CONTRACT ACT OF 1965, AS AMENDED (MAY 1989)

9.19.5 Applicable to Subcontracts over \$3,000

CLAUSE	TITLE
52.222-54	EMPLOYMENT ELIGIBILITY VERIFICATION

9.19.6 Applicable to Subcontracts over \$10,000

CLAUSE	TITLE
52.222-21	PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)
52.222-26	EQUAL OPPORTUNITY (APR 2002)
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

9.19.7 Applicable to Subcontracts over \$25,000

CLAUSE	TITLE
52.222-35	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)

9.19.8 Applicable to Subcontracts over \$100,000

CLAUSE	TITLE	INSTRUCTIONS
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)	
52.203-7	ANTI-KICKBACK PROCEDURES (JUL 1995)	Add to (c)(2): "Seller shall notify Buyer when such action has been taken." In the first sentence of (c)(4) 'the Contract Officer may...' is replaced by 'after the Contracting Officer has effected an offset at the prime contract level or has directed Buyer to withhold any sum from the Seller, Buyer shall...'
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)	
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 2003)	

CLAUSE	TITLE	INSTRUCTIONS
52.215-2	AUDIT AND RECORDS – NEGOTIATIONS (JUNE 1999)	
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2001)	
52.222-4	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT – OVERTIME COMPENSATION (SEP 2000)	
52.223-14	TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)	
52.227-1	AUTHORIZATION AND CONSENT (JUL 1995)	
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)	

9.19.9 Applicable to Subcontracts over \$500,000

CLAUSE	TITLE
52.230-6	ADMINISTRATION OF COST ACCOUNTING STANDARDS (NOV 1999) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)
952.226-74	DISPLACED EMPLOYEE HIRING PREFERENCE (JUNE 1997)
970.5226-2	WORKFORCE RESTRUCTURING UNDER SECTION 3161 OF THE NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1993 (DEC 2000)
52.219-9	SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) ALTERNATIVE II (OCT 2001) Threshold for Construction is \$1,000,000. (Does not apply to small business or those instances where subcontracting opportunities are not available at the time of award.)

9.19.10 Applicable to Subcontracts over \$550,000

CLAUSE	TITLE
52.215-10	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)
52.215-11	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-13	SUBCONTRACTOR COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-15	PENSION ADJUSTMENTS AND ASSET REVERSIONS (JAN 2004)
52.215-18	REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)
52.215-19	NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

9.19.11 Applicable to Subcontracts over \$650,000

CLAUSE	TITLE
52.230-2	COST ACCOUNTING STANDARDS (APR 1998) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)

9.19.12 Applicable to Subcontracts Where Nuclear Hazards May Exist

CLAUSE	TITLE
952.223-75	PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)
952.250-70	NUCLEAR HAZARDS INDEMNITY AGREEMENT (OCT 2005)

9.19.13 Applicable to Subcontracts Where Government Property is Provided

CLAUSE	TITLE
52.244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS) (MAY 2004)
52.244-1	PROPERTY RECORDS (APR 1984) (Only applicable when WCH maintains the official property records.)
52.245-25	LIMITATION OF LIABILITY – SERVICES (FEB 1997)
952-244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-MATERIAL, OR LABOR-HOUR CONTRACTS)

9.19.14 Applicable to Subcontracts Where Technical Data or Computer Software will be Produced, Furnished or Acquired

CLAUSE	TITLE
52.227-14	RIGHTS IN DATA GENERAL (JUNE 1987) ALTERNATIVE V (JUNE 1987) AS MODIFIED PURSUANT TO DEAR 927.409 (a)

9.19.15 Applicable to Cost Reimbursement Subcontracts

CLAUSE	TITLE	INSTRUCTIONS
52.216-7	ALLOWABLE COST AND PAYMENT (DEC 2002)	(a) (3) 30 days
52.216-8	FIXED FEE (MAR 1997)	
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)	
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)	
52.244-2	SUBCONTRACTS (AUG 1998) – ALTERNATE II (AUG 1998)	
952.216-7	ALLOWABLE COST AND PAYMENT (JAN 1997) – ALTERNATE II	
952.251-70	CONTRACTOR EMPLOYEE TRAVEL DISCOUNTS (JUNE 1995)	
970.5204-3	ACCESS TO AND OWNERSHIP OF RECORDS (DEC 2000)	(b)(1) through (b)(5) are Subcontractor-owned records.

9.19.16 Applicable to Time and Material Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002)
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)

9.19.17 Applicable to Labor-Hour Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002) ALTERNATE II (FEB 2002)
52.242-15	STOP-WORK ORDER (AUG 1989) - ALTERNATE I (APR 1984)

///

DISTRIBUTION

	NAME	MISN	With Att.
	Day, J. R.	T2-10	
<input checked="" type="checkbox"/>	Howard, B.J.	T2-10	
	Klickovich, B.D.	T2-10	
<input checked="" type="checkbox"/>	Looney, D.	H4-17	
<input checked="" type="checkbox"/>	Melvin, W.F.	T2-10	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Palmersheim, S.M.	H4-17	
	Schilperoort, D.L.	T2-10	
<input checked="" type="checkbox"/>	Skiba, C.V.	T2-10	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Wintle, T.E.	T2-10	<input checked="" type="checkbox"/>
X	ERDF Project Files	T2-10	X
X	Document Control	H4-11	X

	NAME	MISN	With Att.
	Bentz, C.A.	T2-02	
<input checked="" type="checkbox"/>	Borlaug, W.A.	T2-03	<input checked="" type="checkbox"/>
	Caulfield, R.A.	T2-03	
	Hanks, B.	T2-10	
	Lamb, F.O.	T2-05	
	Laws, J.R.	T2-05	
	Lawrence, H.K.	T2-05	
	Nixon, B.C.	T2-05	
	Riley, D.A.	T2-05	

Subcontract/No.

Change Notice

Description

TradeWind, S012308A00

CN- _____

DelHur, S010544A00

CN- _____

W.Boos, 0600X-SC-G0524

CN- _____

Envirotech, S66X528A00

CN- 003

EXHIBIT A, REV. 8, CERTIFIED PR

Comments:

CQA



Distribution Completed:

Yes: **X**

No: _____

Initials **DGT**

TO BE COMPLETED BY R&DC:

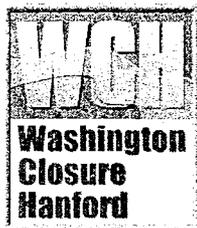
RECORD TYPE _____

DATA ENTRY BY _____

REPRO BY _____

SCANNED/# PGS _____

DOCS OPEN # _____



149044

March 3, 2010

Mr. Joe Voss, Project Manager
Envirotech Engineering and Consulting, Inc.
2620 Fermi Ave. MSIN: T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-002, INCORPORATE REVISED VERSIONS OF
EXHIBITS "A" AND "B" INTO SUBCONTRACT DOCUMENTS
(FUNDED BY THE AMERICAN RECOVERY AND REINVESTMENT ACT)**

Dear Mr. Voss:

Envirotech Engineers and Consultants, Inc. are hereby directed to incorporate the revised (and attached) versions of Subcontract Exhibits "A" and "B."

Exhibit "A" now contains a new clause for E-Verify requirements in section 73. Exhibit "B" now contains the steps for Hanford site closure and notification in section 6.1.2.

This work is funded by the American Recovery and Reinvestment Act of 2009 (ARRA).

If you have any questions regarding this change notice, please contact me at (509) 373-9476, or (509) 942-9275, or via email (the preferred method).

Sincerely,

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachments: (A) Change Notice CN-002
(B) Exhibit "A" CQA, Rev. 1
(C) Exhibit "B" CQA, Rev. 2



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: Envirotech Engineers and Consultants, Inc.	Letter No.:
Address: 2620 Fermi Ave., MSIN T2-11 Richland, WA 99354 Mr. Joe Voss, Project Manager	Effective Date: 02/17/10
	Subcontract No.: S013213A00
	Change Notice No.: CN-002

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:
INCORPORATE CHANGES TO SUBCONTRACT EXHIBITS "A" and "B".
This change notice is American Recovery and Reinvestment Act of 2009 (ARRA)-funded.

Envirotech Engineers and Consultants are hereby directed to replace Exhibit "A", General Conditions and Exhibit "B", Special Conditions with the new attached revisions. WCH does not consider the revisions to Exhibits "A" and "B" to have any cost impact, and they, therefore, do not require a cost proposal.

<input checked="" type="checkbox"/> Proceed with work	<input type="checkbox"/> Notice to proceed required
<input checked="" type="checkbox"/> No change in price authorized	<input checked="" type="checkbox"/> No extension of time authorized
<input checked="" type="checkbox"/> Proposal not required	<input type="checkbox"/> Submit proposal within _____ days
<input checked="" type="checkbox"/> Drawings/Data attached	<input type="checkbox"/> _____

Project Manager/CAM:

William F. Melvin WFM 3/2/10
 Print Name Signature Date

STR:

Charles V. Skiba [Signature] 3-2-10
 Print Name Signature Date

Procurement:

Dana D. Looney [Signature] 3-3-10
 Print Name Signature Date

Initial: N/A N/A N/A N/A N/A

Safety QA Eng. Env. RadCon

- Acknowledge and accept this change notice as specified.
- Acknowledge and accept with the exception of the following:

<input type="checkbox"/> ARE proceeding with this change notice	A proposal: <input type="checkbox"/> Has been submitted
<input type="checkbox"/> ARE NOT proceeding with this change notice	<input type="checkbox"/> Will be submitted within _____ days
	<input type="checkbox"/> Will not be submitted

Signature: _____ Company: Envirotech Engineers and Consultants, Inc. Date: _____

EXHIBIT A

CONSTRUCTION SUBCONTRACTS GENERAL CONDITIONS

DO NOT ALTER THIS DOCUMENT

REV.	DATE	Explanation	Originator	Checker
07	December 31, 2009	Initiate E-Verify Requirements in FAR Clauses	L. Cortez	R. M. Harrison
06	July 7, 2009	Correction of Typographical Error	L. Cortez	D. Houston
River Corridor Closure Project			Subcontractor Terms & Conditions	

EXHIBIT "A"

WASHINGTON CLOSURE HANFORD, LLC

CONSTRUCTION SUBCONTRACTS

GENERAL CONDITIONS

WASHINGTON CLOSURE HANFORD LLC

EXHIBIT "A"

TABLE OF CONTENTS

1.0	SCOPE	1
2.0	STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES	1
3.0	DEFINITIONS	1
4.0	ENTIRE AGREEMENT	1
5.0	SUBCONTRACT INTERPRETATION	2
6.0	ORDER OF PRECEDENCE	2
7.0	THE SUBCONTRACTOR	2
GC 7.1	Independent Contractor	2
GC 7.2	Permits and Licenses	2
GC 7.3	Labor, Personnel, and Site Work Rules or WCH Policy	3
GC 7.4	Hanford Site Training	3
GC 7.5	Security	3
GC 7.6	Environment, Safety and Health	6
GC 7.7	Site Conditions and Natural Resources	7
GC 7.8	Differing Site Conditions	8
GC 7.9	Environmental Conditions	8
GC 7.10	Cultural Resources Awareness	9
GC 7.11	Worker Safety and Health Program (Civil Penalties Under 10 CFR 851	9
GC 7.12	Survey Control Points and Layouts	10
GC 7.13	SUBCONTRACTOR'S Work Area	10
GC 7.14	Cleaning Up	10
GC 7.15	Responsibility for Security of Work and Property	10
GC 7.16	SUBCONTRACTOR'S Plant, Equipment, and Facilities	11
GC 7.17	Illumination	12
GC 7.18	Use of CONTRACTOR's Construction Equipment or Facilities	12
GC 7.19	Warranty	12
GC 7.20	Inspection, Quality Surveillance, Rejection of Materials and Workmanship	13
GC 7.21	Testing	13
GC 7.22	Expediting	13
GC 7.23	Progress	14
GC 7.24	Excusable Delays	14
GC 7.25	Cooperation with Others	14
GC 7.26	Use of Completed Portions of Work	14
GC 7.27	Suspension	15
GC 7.28	Commercial Activities	16
GC 7.29	Publicity and Advertising	16
GC 7.30	Quality Assurance Program	16
GC 7.31	SUBCONTRACTOR Employee Concerns Program	16
GC 7.32	Workers Compensation Requirements	17
GC 7.33	Insurance	17
8.0	THE CONTRACTOR	21
GC 8.1	Authorized Representatives	21
GC 8.2	Medical Examinations	22
GC 8.3	First Aid Facilities	22
GC 8.4	Notices	22
GC 8.5	Changes	22
GC 8.6	Final Inspection and Acceptance	23
GC 8.7	Emergency Situation	24
9.0	GENERAL SUBCONTRACT PROVISIONS	24
GC 9.1	Applicable Law	24
GC 9.2	Words and Phrases	24

GC 9.3	Taxes	25
GC 9.4	Backcharges	25
GC 9.5	Examination of SUBCONTRACTOR's Record's and Accounts.....	26
GC 9.6	Title to Materials Found	26
GC 9.7	Termination for Default	26
GC 9.8	Termination for Convenience.....	27
GC 9.9	Non-Waiver	28
GC 9.10	Indemnity, Fines and Penalties	28
GC 9.11	Patent and Intellectual Property Indemnity.....	29
GC 9.12	Assignments and Subcontracts	29
GC 9.13	Survival	30
GC 9.14	Disputes.....	30
GC 9.15	Nondisclosure	30
GC 9.16	Procurement Integrity	31
GC 9.17	Rights in Data	31
GC 9.18	Continuity of Service.....	31
GC 9.19	Government Flowdowns.....	31

EXHIBIT "A"
CONSTRUCTION SUBCONTRACT GENERAL CONDITIONS

1.0 SCOPE

This Exhibit A provides General Terms and Conditions that apply to all Subcontracts providing Construction technical services to Washington Closure Hanford LLC.

2.0 STANDARDS, CODES, LAWS, REGULATIONS, AND DOE DIRECTIVES

- 2.1 Wherever references are made in this Subcontract to standards or codes in accordance with which the Work under this Subcontract is to be performed, the edition or revision of the standards or codes current on the effective date of this Subcontract shall apply unless otherwise expressly stated. If conflict occurs between any standards and codes referenced in the Subcontract Documents and any Subcontract Documents, the latter shall govern.
- 2.2 If SUBCONTRACTOR discovers any discrepancy or inconsistency between this Subcontract and any law, ordinance, statute, rule, regulation, order or decree, SUBCONTRACTOR shall report the same immediately, in writing, to CONTRACTOR who will issue such further instructions as may be necessary..
- 2.3 In performing Work under this Subcontract, the SUBCONTRACTOR shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), in effect at the time the work under this Subcontract is performed unless relief has been granted in writing by the appropriate regulatory agency.
- 2.4 If during the term of this Subcontract there are changed or new laws, ordinances, statutes, rules, regulations, orders or decrees not known or foreseeable at the time of signing this Subcontract that become effective and that affect the cost or time of performance of this Subcontract, SUBCONTRACTOR shall immediately notify CONTRACTOR in writing and submit detailed documentation of such effect in terms of both time and cost of performing the Subcontract. If the Work is affected by such changed or new laws, ordinances, etc., and CONTRACTOR concurs with the effect of such changes, an equitable adjustment in compensation and time of performance will be made, provided the OWNER approves such equitable adjustments in compensation and time of performance.

3.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH)

"SUBCONTRACTOR" means the legal entity which contracts with WCH.

"Subcontractor's Technical Representative" means the CONTRACTOR'S authorized representative.

"GOVERNMENT/OWNER" means the United States Government and/or the Department of Energy Richland Operations Office (DOE-RL).

4.0 ENTIRE AGREEMENT

This Subcontract embodies the entire agreement between the CONTRACTOR and SUBCONTRACTOR and supersedes all other writings. The parties shall not be bound by, or be liable for any statement, representation, promise, inducement, or understanding not set forth herein.

5.0 SUBCONTRACT INTERPRETATION

All questions concerning interpretation or clarification of this Subcontract, including the discovery of conflicts, errors or omissions, or the acceptable performance thereof by SUBCONTRACTOR, shall be immediately submitted in writing to the CONTRACTOR for resolution. All determinations, instructions, and clarifications of CONTRACTOR shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. At all times SUBCONTRACTOR shall proceed with the Work in accordance with the determinations, instructions, and clarifications of CONTRACTOR. SUBCONTRACTOR shall be solely responsible for requesting instructions or interpretations and shall be solely liable for any costs and expenses arising from its failure to do so.

6.0 ORDER OF PRECEDENCE

The Subcontract Agreement form or the Master Agreement form and individual Task Order Subcontracts, all documents listed therein, and subsequently issued Change Notices and modifications are essential parts of this Subcontract or Master Agreement and Task Order Subcontracts, and a requirement occurring in one is binding as though occurring in all. In resolving conflicts, discrepancies, errors, or omissions pursuant to the General Condition titled "SUBCONTRACT INTERPRETATION," the following order of precedence shall be used:

1. Subcontract Change Notices and Modifications, if any
2. Individual Task Order Subcontracts (which may include supplements to the Master Agreement)
3. The Subcontract Agreement Form or the Master Agreement Form
4. Exhibit "H" – Hanford Site Stabilization Agreement
5. Exhibit "C" – Schedule of Quantities and Prices
6. Exhibit "B" – Special Conditions
7. Exhibit "A" – General Conditions
8. Exhibit "G" – Subcontractor Safety and Health Requirements
9. Exhibit "J" – Subcontractor Environmental and Waste Management Requirements
10. Exhibit "K" – Integrated Work Control Program Procedure PAS-2-1.1 (if applicable)
11. Exhibit "D" – Scope of Work
12. Exhibit "F" – Drawings
13. Exhibit "E" – Technical Specifications
14. Exhibit "I" – Subcontractor Submittal Requirements Summary
15. Subcontractor Submittals

7.0 THE SUBCONTRACTOR

GC 7.1 Independent Contractor

SUBCONTRACTOR represents that it is fully experienced, properly qualified, registered, licensed, equipped, organized, and financed to perform the Work under this Subcontract. Subcontractor shall act as an independent contractor and not as the agent of CONTRACTOR or OWNER in performing this Subcontract, maintaining complete control over its employees and all of its lower-tier suppliers and subcontractors. Nothing contained in this Subcontract, or any lower-tier purchase order or subcontract awarded by SUBCONTRACTOR, shall create any contractual relationship between any lower-tier supplier or subcontractor and either CONTRACTOR or OWNER. SUBCONTRACTOR shall perform the Work hereunder in accordance with its own methods subject to compliance with the Subcontract.

GC 7.2 Permits and Licenses

Except as otherwise specified, SUBCONTRACTOR shall procure and pay for all permits, licenses, and inspections, other than inspections performed by CONTRACTOR and shall furnish any bonds, security, or deposits required by the Government, state, territory, municipality, or other political subdivision to permit performance of the Work hereunder. This includes, but is not necessarily limited to, identifying if such permits and licenses are required, compiling the information and data required for applications to obtain permits and licenses, filing of necessary applications for such permits and licenses, and providing any additional information or data required.

Where permits and licenses are furnished by the CONTRACTOR or OWNER, the SUBCONTRACTOR shall provide all reasonable assistance requested, including any necessary information or data.

GC 7.3 Labor, Personnel, and Site Work Rules or WCH Policy

- 7.3.1 Subcontractor shall comply with FAR Clause 52.222.54, "Employment Eligibility Verification." To comply, Subcontractor will enroll in E-Verify at www.dhs.gov/E-verify. Upon CONTRACTOR request, Subcontractor shall provide CONTRACTOR a copy of its "Maintain Company" page, printed directly from E-Verify.
- 7.3.2 SUBCONTRACTOR shall employ only competent and skilled personnel to perform the Work and shall remove from the Jobsite any SUBCONTRACTOR personnel determined by the CONTRACTOR to be unfit or to be acting in violation of any provision of this Subcontract, WCH, or Hanford Site policies. SUBCONTRACTOR is responsible for maintaining labor relations in such a manner that there is harmony among workers and shall comply with and enforce Jobsite procedures, regulations, and site work rules or WCH policy established by CONTRACTOR and OWNER.
- 7.3.3 SUBCONTRACTOR shall, to the extent permissible under applicable law, comply with the provisions of all labor agreement(s), inclusive of the Hanford Site Stabilization Agreement, which apply to the Work performed under this Subcontract (e.g., Project Agreement, collective bargaining agreement(s), etc.). SUBCONTRACTOR shall pay rates of wages and shall observe hours of Work and other economic terms and conditions of employment equivalent to those paid and observed by CONTRACTOR, all of which shall be subject to CONTRACTOR'S approval.
- 7.3.4 Work assignments and the settlement of jurisdictional disputes shall conform with either the Rules, Regulations, and Procedures of the Plan for Settlement of Jurisdictional Disputes in the Construction Industry, and any successor agreement thereto, or any other mutually established method of determining work assignments and settling jurisdictional disputes.

GC 7.4 Hanford Site Training

In the performance of work under this Subcontract, SUBCONTRACTOR shall adhere to all the training requirements as outlined and stipulated under Exhibit "G", Subcontractor Safety and Health Requirements. SUBCONTRACTOR is responsible for all labor costs for employees receiving training. SUBCONTRACTOR is also responsible for tuition costs for initial and annual refresher Radworker II training. SUBCONTRACTOR is responsible for all scheduling and coordination for Radworker II training. Additionally, SUBCONTRACTOR will be responsible for all costs incurred by CONTRACTOR for failure to report (no shows) to any scheduled training by SUBCONTRACTOR'S personnel and lower-tiers. All scheduling of HGET shall be given to STR at least two weeks in advance of the HGET training needed.

GC 7.5 Security

- 7.5.1 In the performance of the Work under this Subcontract, SUBCONTRACTOR shall comply with the following requirements from the CONTRACTOR/OWNER security program:
- 7.5.1.1 Incidents. Prompt verbal notification of incidents of loss, theft, vandalism, violence, threats, and misconduct to the CONTRACTOR, subsequently detailed in a written report.
- 7.5.1.2 Prohibited Articles. Property passes are required for the movement of prohibited articles into and out of any areas of the Hanford Site. Prohibited articles include:
- Dangerous weapons
 - Explosives, ammunition, and incendiary devices.
 - Controlled substances and drug paraphernalia.
 - Alcoholic beverages.
 - Contraband (includes other items prohibited by law).

- (a) The SUBCONTRACTOR will notify the CONTRACTOR if it becomes necessary to transport prohibited articles onto the Hanford Site. Upon CONTRACTOR and OWNER approval, the CONTRACTOR will issue the appropriate property pass. SUBCONTRACTOR employees transporting prohibited articles within the Hanford Site must have a valid property pass in their possession.
- (b) SUBCONTRACTOR employees and employees of its lower-tier subcontractors discovered on the Hanford Site in possession of any prohibited article, and not in possession of a valid property pass, shall have their badge and prohibited article returned to the OWNER and their access to the Hanford Site suspended. If it is legally allowable for the individual to possess the prohibited article, the badge and prohibited article will be returned within two working days. If it is illegal for the individual to possess the prohibited article, the prohibited article will be turned over to local law enforcement and the individual's access to the Hanford Site will be denied for a minimum of one (1) year.

7.5.1.3

Security Badges. Any person assigned to work on the Hanford Site or any designated CONTRACTOR facility shall be required to wear a CONTRACTOR issued security badge identifying him/her. If any such persons are foreign nationals, special procedures shall apply when applying for and receiving a security badge. The identification badge shall be worn in plain view, above the waist, on the front of the body, on the outer most layer of clothing. If required, a dosimeter will be issued in conjunction with the security badge.

- (a) Badging for more than seven (7) days requires SUBCONTRACTOR employees, and employees of their lower-tier subcontractors, vendors, and visitors to complete Hanford General Employee Training (HGET).
- (b) SUBCONTRACTOR shall provide to CONTRACTOR the individual(s) complete name (as it appears on the photo identification to be used), name and address of the company being represented, reason for access, social security number, date of birth (mm/dd/yyyy), place of birth (city, state/province, country), and citizenship of the individual(s) requiring a badge at least two (2) working days prior to the date the employee(s) first require the badge(s) for work performance.
- (c) It is the responsibility of the SUBCONTRACTOR to provide the CONTRACTOR with a minimum of two (2) weeks notice if the SUBCONTRACTOR will be requesting access to the work site for a foreign national. This will extend to six (6) weeks notice if the foreign national is from a sensitive country as defined by the OWNER.
- (d) Badges will be issued by CONTRACTOR at locations and according to schedules provided by the CONTRACTOR. Central Badging Office hours are normally 7:00 a.m. through 4:30 p.m., Monday through Thursday, and 7:00 a.m. through 3:30 p.m., Friday. CONTRACTOR temporary badging hours are normally 6:30 a.m. through 5:00 p.m., Monday through Thursday.
- (e) The employee, vendor, or visitor must appear in person to obtain a badge. Badge applicants must provide proof of identification and completion of HGET to the issuing office.
- (f) The OWNER will issue security badges free of charge.
- (g) Security badges will be valid only for the duration of a specific Subcontract or for one (1) calendar year from the date of issuance, whichever ends first. If a Subcontract extends beyond one (1) year, SUBCONTRACTOR employees must obtain a new badge prior to the expiration date of the current badge.
- (h) A new security badge must be obtained whenever there is a significant change in facial appearance, e.g., growth or removal of facial hair, changes resulting from surgery, etc.

(i) U.S. Department of Energy (DOE) security badges are the property of the Government and must be returned to the CONTRACTOR whenever an individual is transferred, terminates employment or otherwise no longer requires the badge. Badges of departing visitors shall be turned over to CONTRACTOR or security force personnel at the conclusion of the visit at the final security checkpoint. It is the responsibility of the SUBCONTRACTOR to implement a Badge Recovery Policy to ensure its employees, vendors and sub-tier personnel:

§ Report a lost or stolen badge to the CONTRACTOR'S representative within twenty-four (24) hours of discovery,

§ Return the security badge to the CONTRACTOR when no longer valid or when requested to by CONTRACTOR, OWNER, and/or protective (security) force personnel.

(j) A charge of \$1,000.00 will be assessed to the SUBCONTRACTOR for each security badge that is not returned. Such charges will be deducted from payments otherwise due the SUBCONTRACTOR. Refund of charges, previously collected for badges and/or dosimeters subsequently found may not be made after the date of final payment to the SUBCONTRACTOR.

(k) The SUBCONTRACTOR is responsible for all labor costs associated with the badging and security training requirements.

7.5.1.4 Security Orientation. Each SUBCONTRACTOR visitor/vendor, and visitor/vendors of their lower-tier subcontractors, will receive a security orientation booklet from the CONTRACTOR or OWNER prior to being issued a visitor security badge.

7.5.1.5 Computer Security. Each SUBCONTRACTOR employee, and employees of their lower-tier subcontractors that are granted access to the CONTRACTOR or OWNER information networks, are required to adhere to the restrictions and limitations of the CONTRACTOR computer security program. These requirements can be obtained from the CONTRACTOR Computer Protection Program Manager.

7.5.1.6 "Official Use Only" Information Security. Each SUBCONTRACTOR employee, and employees of their subcontractors that are granted access to "Official Use Only" sensitive unclassified information provided by the CONTRACTOR/OWNER of the information must adhere to the restrictions and limitations of the CONTRACTOR regarding the access, control, and destruction of the information. These requirements include ensuring that any SUBCONTRACTOR employee or employees of their subcontractors having access to the information meet the following requirements:

(a) The employee granted access to the information has a need to know.

(b) Advise the employee not to divulge the information to persons who do not have a need to know.

(c) Provide protection against theft or unauthorized removal/distribution of the information.

(d) When use of the information is completed, any documents or data shall be destroyed by shredding in accordance with established procedures.

7.5.1.7 A Security Program Plan shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any even prior to commencing Work at the Jobsite. The Program Plan shall include a description of how the SUBCONTRACTOR will implement the applicable requirements of this section and the additional requirements below.

- (a) Controlled access to office, warehouse, material and equipment sites.
- (b) Accountability procedures for the requisition and issue of materials.
- (c) Periodic security checks for all work areas assigned to SUBCONTRACTOR.
- (d) Prompt reporting of incidents of loss, theft, or vandalism to CONTRACTOR, subsequently detailed in writing.
- (e) Coordination and compliance with Site security programs.

7.5.2 The written Security Program Plan is set forth in Exhibit I and is a required Subcontractor Submittal.

7.5.3 Security of Work. SUBCONTRACTOR shall, at all times, conduct all operations under this Subcontract in a manner to avoid the risk of loss, theft, or damage by vandalism, sabotage, or any other means to any work, materials, equipment, or other property at the Jobsite. SUBCONTRACTOR shall continuously inspect all Work, materials and equipment to discover and determine any conditions that might involve such risks and shall be solely responsible for discovery, determination, and correction of any such conditions.

7.5.4 SUBCONTRACTOR shall comply with CONTRACTOR'S security requirements for the Jobsite. SUBCONTRACTOR shall cooperate with CONTRACTOR on all security matters and shall promptly comply with any project security arrangements established by CONTRACTOR or OWNER. Such compliance with these security requirements shall not relieve SUBCONTRACTOR of its responsibility for maintaining proper security for the above-noted items, nor shall it be construed as limiting in any manner SUBCONTRACTOR'S obligation with respect to all applicable laws and regulations and to undertake reasonable action to establish and maintain security conditions at the Jobsite.

7.5.5 The CONTRACTOR may also require that the SUBCONTRACTOR be removed from the job, at no additional cost to CONTRACTOR, employees who endanger persons or property, disruptive to the workforce, or whose continued employment under this Subcontract is inconsistent with the requirements of the Subcontract and/or interests of safety or security at the Hanford Site.

GC 7.6 Environment, Safety and Health

CONTRACTOR sets forth its full requirements for environment, safety and health in Exhibit "G", "Subcontractor Safety and Health Requirements," and Exhibit "J", "Subcontractor Environmental and Waste Management Requirements." These Exhibits, if included in this Subcontract, are fully integrated and a part hereof. The contents of Exhibit "G" and Exhibit "J" notwithstanding, the following applies to this Subcontract:

7.6.1 SUBCONTRACTOR shall be fully and solely responsible for conducting all operations under this Subcontract at all times in such a manner as to avoid the risk of harm to the environment, persons and/property. SUBCONTRACTOR shall continually and diligently inspect all Work, materials, and equipment to discover any conditions that might involve such risks and shall be solely responsible for discovery and correction of any such conditions.

7.6.2 SUBCONTRACTOR shall comply with CONTRACTOR'S Safety and Health Requirements including its Integrated Safety Management System (ISMS) Plan. SUBCONTRACTOR shall have sole responsibility for implementing its safety program. All of SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this General Condition titled "ENVIRONMENT, SAFETY AND HEALTH."

7.6.3 Neither CONTRACTOR nor OWNER shall be responsible for supervising the implementation of SUBCONTRACTOR'S safety program, and neither CONTRACTOR nor OWNER shall have responsibility for the safety of SUBCONTRACTOR'S or its lower-tier suppliers' or subcontractors' employees.

7.6.4 SUBCONTRACTOR'S failure to correct an unsafe condition or unsafe act or condition or act that negatively impacts the environment by its personnel after notice thereof shall be grounds for:

- (a) An order to suspend the affected operations until the unsafe condition is corrected and,
- (b) If the violation continues, default termination of this Subcontract for such failure under the clause entitled, "Termination for Default," below.

7.6.5 SUBCONTRACTOR shall designate one or more (as appropriate) Environmental, Safety and Health (ES&H) Representatives(s) acceptable to CONTRACTOR who shall be resident at the Jobsite, have responsibility to correct unsafe conditions or unsafe acts, act on behalf of SUBCONTRACTOR on environment, health and safety matters, and participate in periodic environment, safety and health meetings with CONTRACTOR. SUBCONTRACTOR shall instruct its personnel on the CONTRACTOR'S Health and Safety Requirements and SUBCONTRACTOR'S safety program and shall coordinate with other subcontractors on safety matters.

7.6.6 SUBCONTRACTOR shall furnish safety equipment and enforce the use of such equipment by its employees.

7.6.7 SUBCONTRACTOR shall maintain accident, injury, and any other records required by applicable laws and regulations (e.g., OSHA, etc.) or by CONTRACTOR and shall furnish CONTRACTOR a monthly summary of injuries and labor hours lost due to injuries.

GC 7.7 Site Conditions and Natural Resources

7.7.1 SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the nature and location of the Work and the general and local conditions, including, but not limited to, the following:

- (a) Transportation, access, disposal, and handling and storage of materials.
- (b) Availability and quality of labor, water, electric power and road conditions.
- (c) Climatic conditions, tides, and seasons.
- (d) River hydrology and river stages.
- (e) Physical conditions at the Jobsite and the project area as a whole.
- (f) Topography and ground surface conditions.
- (g) Equipment and facilities needed preliminary to and during the performance of the Work.
- (h) Radiological conditions of surface or subsurface.

7.7.2 The failure of SUBCONTRACTOR to acquaint itself with any applicable conditions will not relieve SUBCONTRACTOR of the responsibility for properly estimating either the difficulties or the cost of successfully performing SUBCONTRACTOR'S obligations under this Subcontract.

7.7.3 Where CONTRACTOR or OWNER has made investigations of subsurface conditions in areas where Work is to be performed under this Subcontract, such investigations are made by CONTRACTOR and OWNER for the purpose of study and design. If the records of such investigation are included in the Subcontract Documents, the interpretation of such records shall be the sole responsibility of SUBCONTRACTOR. Neither CONTRACTOR nor OWNER assumes any responsibility whatsoever in respect to the sufficiency or accuracy of such investigations, the records thereof, or of the interpretations set forth; and there is no warranty or guarantee, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such proportions different from those indicated may not be encountered.

GC 7.8 Differing Site Conditions

- 7.8.1 The Hanford Site was used for nuclear work related to the production of weapons for the defense of the country. Unidentified sources of radioactive material exist in Hanford Site soil. SUBCONTRACTOR shall promptly notify CONTRACTOR, in writing, before proceeding with any Work that SUBCONTRACTOR believes constitutes a differing site condition with respect to:
- (a) Subsurface or latent physical conditions at the Jobsite differing materially from those indicated in this Subcontract, or
 - (b) Previously unknown physical conditions at the Jobsite, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Subcontract, or
- 7.8.2 CONTRACTOR will, as promptly as practicable, investigate such conditions and make a determination. If CONTRACTOR determines that such conditions do materially so differ and cause an increase or decrease in SUBCONTRACTOR'S cost of or the time required for performance of the Work under the Subcontract, an adjustment will be made and the Subcontract modified, in writing, accordingly. No claim of SUBCONTRACTOR under this clause will be allowed unless SUBCONTRACTOR has given the required notice.

GC 7.9 Environmental Conditions

- 7.9.1 Throughout performance of the Work, SUBCONTRACTOR shall conduct all operations in such a way as to minimize impact upon the natural environment and prevent any spread of contaminated or hazardous material. SUBCONTRACTOR shall provide:
- (a) Dust control of its operations within work and all other areas under its control and shall coordinate and cooperate with others for dust control in common areas.
 - (b) Working machinery and equipment with efficient noise suppression devices and all other noise and vibration abatement measures necessary for the protection of workers and the public.
 - (c) Suitable waste, sewage, sanitary, and garbage disposal methods and procedures approved by CONTRACTOR.
 - (d) Provide suitable equipment, facilities, and precautions to prevent the discharge of contaminants into the atmosphere, any body of water, or land areas.
 - (e) All documentation required by all levels of governing authority of this Subcontract concerning environmental requirements.
 - (f) Responsibility for developing and maintaining a written Environmental Compliance Plan in accordance with SUBCONTRACTOR'S established practices, including, but not limited to, compliance with all applicable laws and all applicable requirements in the Project Environmental Control Plan. SUBCONTRACTOR shall have sole responsibility for developing, implementing, and enforcing its Environmental Compliance Plan and SUBCONTRACTOR'S obligations under the General Condition titled "INDEMNITY" apply to any liability arising in connection with or incidental to SUBCONTRACTOR'S performance or failure to perform, as provided in this clause.
- 7.9.2 SUBCONTRACTOR shall submit its written Environmental Compliance Plan to CONTRACTOR for review before commencing work at the Jobsite. The plan shall be submitted in accordance with Exhibit I and shall include all elements set forth in Exhibit J. CONTRACTOR'S review of SUBCONTRACTOR'S Plan shall not relieve SUBCONTRACTOR of its obligation under this Subcontract or as imposed by law, and SUBCONTRACTOR shall be solely responsible for the adequacy of its Environmental Compliance Plan.
- 7.9.3 If SUBCONTRACTOR encounters material on the Jobsite reasonably believed to be toxic or hazardous material or waste, which has not been addressed in this Subcontract, SUBCONTRACTOR shall

immediately stop work in the affected area and notify CONTRACTOR and OWNER of the condition. Pending receipt of written instructions from CONTRACTOR, SUBCONTRACTOR shall not resume work in the affected area.

GC 7.10 Cultural Resources Awareness

- 7.10.1 SUBCONTRACTOR shall comply with the provisions of the Native American Graves Protection Act 25 USC 3001-3013. This act establishes statute provisions for the treatment of Native American remains and cultural objects. If during the performance of this Subcontract, SUBCONTRACTOR discovers Native American remains and/or cultural objects, SUBCONTRACTOR shall immediately cease work in the affected work area, take reasonable efforts to protect the items discovered, and notify the CONTRACTOR'S STR. Work in the affected area may be prohibited for a period not to exceed thirty (30) calendar days. Cessation of work under the provisions of this article for periods of up to thirty (30) calendar days shall not be cause for an excusable delay.
- 7.10.2 Cultural resources are known to exist on the Hanford Reservation. The SUBCONTRACTOR shall use previously disturbed areas, whenever possible, while conducting work activities. The SUBCONTRACTOR shall also ensure workers are trained to recognize culturally significant resources. CONTRACTOR shall provide one (1) hour training for SUBCONTRACTOR employees on cultural resources awareness. SUBCONTRACTOR is responsible for all labor costs associated with this training. All workers shall be directed to visually inspect for cultural resources during all work activities, particularly in undisturbed areas. If any cultural resources are encountered, work in the vicinity of the discovery shall be suspended immediately. In the event of any such discoveries, the SUBCONTRACTOR shall notify the CONTRACTOR'S onsite representative immediately.

GC 7.11 Worker Safety and Health Program (Civil Penalties Under 10 CFR 851)

- 7.11.1 Section 3173 of Public Law 107-314, Bob Stump National Defense Authorization Act of Fiscal Year 2003 amends the Atomic Energy Act (AEA) by adding Section 234C, Worker Health and Safety Rules for Department of Energy Nuclear Facilities. The Department of Energy (DOE) promulgated Procedural Rules (10 CFR 851); Worker Safety and Health Program to comply with Section 234C. These rules govern the conduct of Contractor, Subcontractor and Supplier activities at DOE sites. Violation of the applicable rules will provide a basis for the assessment of civil penalties under the CFR ruling on Contractors, Subcontractors and Suppliers. Title 10 CFR 851 sets forth the procedures DOE (OWNER) will use in exercising its enforcement authority, including the issuance of "Notices of Violation" and the resolution of an administrative appeal in the event the Contractor or Subcontractor elects to petition the Office of Hearings and Appeals for Review.
- 7.11.2 This Subcontract or Purchase Order is subject to the requirements of 10 CFR 851, if under its terms the Supplier or Subcontractor is required to perform work at the Hanford Site.
- 7.11.3 DOE (OWNER) may assess civil penalties of up to \$70,000 per violation per day. If any violation is a continuing violation, each day of the violation shall constitute a separate violation for the purpose of computing the civil penalty.
- A. A Severity Level I violation is a serious violation. A serious violation shall be deemed to exist in a place of employment if there is a potential that death or serious physical harm could result from a condition which exists or from one or more practices, means, methods, operations or processes which have been adopted or are in use, in such a place of employment. Severity Level I violation would be subject to the base civil penalty of up to 100% of the maximum base civil penalty of \$70,000.
- B. A Severity Level II violation is an other than serious violation. An other than serious violation occurs where the most serious injury or illness that would potentially result from a hazardous condition cannot be reasonably predicted to cause death or serious physical harm to employees but does have a direct relationship to their safety and health. A Severity Level II violation would be subject to the base civil penalty of up to 50% of the maximum base civil penalty or \$35,000.

7.11.4 Indemnification of Contractor (WCH). To the extent permitted by law, Subcontractor or Supplier assumes full responsibility and shall indemnify, hold harmless and defend WCH and its principal subcontractors, their agents, officers, employees, and directors from any civil liability under Section 234C of the Act or the implementing regulations at 10 CFR 851, arising out of the activities of the SUBCONTRACTOR or Supplier, its lower tier subcontractors, suppliers, agents, employees, officers or directors to the extent that the action or inaction of the Subcontractor or Supplier is found to be a direct or indirect cause of the assessment of fines or penalties or the cause of the institution of proceedings against WCH under Sections 234C of the Act. The Subcontractor's or Supplier's obligation to indemnify and hold harmless shall expressly include attorney's fees and other reasonable costs of defending any action or proceeding instituted under Section 234C of the Act of the implementing regulations at 10 CFR 851. A copy of the implementing regulations at 10 CFR 851 will be made available to the Subcontractor or Supplier upon request.

7.11.5 The contents of this article are to be flowed down to all sub-tier subcontractors and suppliers at any level who will perform work at the Hanford Site.

GC 7.12 Survey Control Points and Layouts

7.12.1 Survey control points, as shown on the drawings, will be established by CONTRACTOR.

7.12.2 SUBCONTRACTOR shall complete the layout of all Work and shall be responsible for all requirements necessary for the Work execution in accordance with the locations, lines, and grades specified or shown on the drawings, subject to such modifications as CONTRACTOR may require as Work progresses.

7.12.3 If SUBCONTRACTOR or any of its lower-tier subcontractors or any of their representatives or employees move or destroy or render inaccurate any survey control point, such control point shall be replaced by CONTRACTOR at SUBCONTRACTOR'S expense. No separate payment will be made for survey Work performed by SUBCONTRACTOR.

GC 7.13 SUBCONTRACTOR'S Work Area

All SUBCONTRACTOR Work areas on the Jobsite will be assigned by CONTRACTOR. SUBCONTRACTOR shall confine its operations to the areas so assigned. Should SUBCONTRACTOR find it necessary or advantageous to use any additional off-site area for any purpose whatsoever, SUBCONTRACTOR shall, at its expense, provide and make its own arrangements for the use of such additional off-site areas.

GC 7.14 Cleaning Up

7.14.1 SUBCONTRACTOR shall, at all times, keep its Work areas in a neat, clean, and safe condition.

7.14.2 Upon completion of any portion of the Work, SUBCONTRACTOR shall promptly remove from the Work area all its equipment, construction plant, temporary structures, and surplus materials not to be used at or near the same location during later stages of the Work.

7.14.3 Upon completion of the Work and before final payment, SUBCONTRACTOR shall, at its expense, satisfactorily dispose of all rubbish, remove all plant, buildings, equipment, and materials belonging to SUBCONTRACTOR and return to CONTRACTOR'S warehouse or Jobsite storage area all salvageable CONTRACTOR- or OWNER-supplied materials. SUBCONTRACTOR shall leave the premises in a neat, clean, and safe condition.

7.14.4 If SUBCONTRACTOR fails to comply with the foregoing, CONTRACTOR will accomplish same at SUBCONTRACTOR'S expense.

GC 7.15 Responsibility for Security of Work and Property

7.15.1 Work in Progress, Materials and Equipment. SUBCONTRACTOR shall be responsible for and shall bear any and all risk of loss of or damage to Work in progress, all materials delivered to the Jobsite.

and all materials and equipment until completion and final acceptance of the Work under this Subcontract.

7.15.2 Delivery, Unloading and Storage. SUBCONTRACTOR'S responsibility for materials and plant equipment required for the performance of this Subcontract shall include:

- (a) Receiving and unloading.
- (b) Storing in a secure place and in a manner subject to CONTRACTOR'S review. Outside storage of materials and equipment subject to degradation by the elements shall be in weather-tight enclosures provided by SUBCONTRACTOR.
- (c) Delivering from storage to construction site all materials and plant equipment as required.
- (d) Maintaining complete and accurate records for CONTRACTOR'S inspection of all materials and plant equipment received, stored, and issued for use in the performance of the Subcontract.

7.15.3 Property. SUBCONTRACTOR shall plan and conduct its operations so as not to:

- (a) Enter upon lands in their natural state unless authorized by CONTRACTOR.
- (b) Damage, close, or obstruct any utility installation, highway, road, or other property until permits have been obtained.
- (c) Disrupt or otherwise interfere with the operation of any pipeline, telephone, electric transmission line, ditch, or structure unless otherwise specifically authorized by this Subcontract.
- (d) Damage or destroy cultivated and planted areas, and vegetation such as trees, plants, shrubs, and grass on or adjacent to the premises which, as determined by CONTRACTOR, do not interfere with the performance of this Subcontract. This includes damage arising from performance of Work by operating equipment or stockpiling materials.

SUBCONTRACTOR shall not be entitled to any extension of time or compensation on account of SUBCONTRACTOR'S failure to protect all materials, equipment, and environment, as described herein. All costs in connection with any repairs or restoration necessary or required by reason of unauthorized obstruction, damage, or use shall be borne by SUBCONTRACTOR.

GC 7.16 SUBCONTRACTOR'S Plant, Equipment, and Facilities

- 7.16.1 SUBCONTRACTOR shall provide and use for the Work hereunder only such construction plant and equipment as are capable of producing the quality and quantity of Work and materials required by this Subcontract and within the time or times specified in the Subcontract Schedule.
- 7.16.2 Before proceeding with the Work hereunder, SUBCONTRACTOR shall furnish CONTRACTOR with information and drawings relative to such equipment, plant and facilities as CONTRACTOR may request. Upon written order of CONTRACTOR, SUBCONTRACTOR shall discontinue operation of unsatisfactory plant, equipment, or facilities and shall either modify the unsatisfactory items or remove such items from the Jobsite.
- 7.16.3 SUBCONTRACTOR shall, at the time any equipment is moved onto the Jobsite, present to CONTRACTOR an itemized list of all equipment and tools, including, but not limited to, power tools, welding machines, pumps, and compressors. Said list must include description and quantity, and serial number where applicable. It is recommended that SUBCONTRACTOR identify its equipment by color (other than yellow), decal, and etching. Before removing any or all equipment, SUBCONTRACTOR shall clear such removal through CONTRACTOR.
- 7.16.4 SUBCONTRACTOR shall not remove construction plant, equipment, or tools from the Jobsite before the Work is finally accepted, without CONTRACTOR'S written approval. SUBCONTRACTOR shall

obtain CONTRACTOR'S radiological release of all equipment used in radiological areas before removal.

GC 7.17 Illumination

When any Work is performed at night or where daylight is obscured, SUBCONTRACTOR shall, at its expense, provide artificial light sufficient to permit Work to be carried on efficiently, satisfactorily, and safely, and to permit thorough inspection. During such time periods, the access to the place of Work shall also be clearly illuminated. All wiring for electric light and power shall be installed and maintained in a safe manner and meet all applicable codes and standards.

GC 7.18 Use of CONTRACTOR's Construction Equipment or Facilities

Where SUBCONTRACTOR requests CONTRACTOR and CONTRACTOR agrees to make available to SUBCONTRACTOR certain equipment or facilities belonging to CONTRACTOR for the performance of SUBCONTRACTOR Work under the Subcontract, the following shall apply:

- (a) Equipment or facilities will be charged to SUBCONTRACTOR at agreed rental rates.
- (b) CONTRACTOR will furnish a copy of the equipment maintenance and inspection record, and these records shall be maintained by SUBCONTRACTOR during the rental period.
- (c) SUBCONTRACTOR shall assure itself of the condition of such equipment and assume all risks and responsibilities during its use.
- (d) SUBCONTRACTOR shall, as part of its obligation under the General Condition clause titled "INDEMNITY," release, defend, indemnify, and hold harmless CONTRACTOR and OWNER from all claims, demands and liabilities arising from the use of such equipment.
- (e) CONTRACTOR and SUBCONTRACTOR shall jointly inspect such equipment before its use and upon its return. The cost of all necessary repairs or replacement for damage other than normal wear shall be at SUBCONTRACTOR'S expense.
- (f) If such equipment is furnished with an operator, the services of such operator will be performed under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than the payment of wages, Workers' Compensation Insurance, or other benefits.

GC 7.19 Warranty

- 7.19.1 SUBCONTRACTOR warrants to CONTRACTOR and OWNER that equipment and materials furnished under this Subcontract shall be new, of clear title, and of the most suitable grade of their respective kinds for their intended uses, unless otherwise specified. All workmanship shall be first class and performed in accordance with sound construction practices acceptable to CONTRACTOR. All equipment, materials, and workmanship shall also conform to the requirements of this Subcontract.
- 7.19.2 SUBCONTRACTOR warrants all equipment and material it furnishes and all work it performs against defects in design, equipment, materials, or workmanship either for a period from Work commencement to a date twelve (12) months after Final Acceptance of the Project as a whole by OWNER or the standard commercial warranty period, whichever is more advantageous to the CONTRACTOR.
- 7.19.3 If at any time during the warranty period, CONTRACTOR, OWNER, or SUBCONTRACTOR discover any defect in the design, equipment, materials, or workmanship, immediate notice shall be given to the other parties, SUBCONTRACTOR shall, within a reasonable time, propose corrective actions to cure such defects to meet the requirements of this Subcontract.
- 7.19.4 CONTRACTOR, at its sole discretion, may direct SUBCONTRACTOR in writing and SUBCONTRACTOR agrees to:

- (a) Rework, repair, or remove and replace defective equipment and materials or re-perform defective workmanship to acceptable quality at a time and in a manner acceptable to CONTRACTOR.
- (b) Cooperate with others assigned by CONTRACTOR to correct such defects and pay to CONTRACTOR all actual costs reasonably incurred by CONTRACTOR in performing or in having performed corrective actions.
- (c) Propose and negotiate in good faith an equitable reduction in the Subcontract price in lieu of corrective action.

7.19.5 All costs incidental to corrective actions, including demolition for access, removal, disassembly, transportation, reinstallation, reconstruction, retesting, and reinspection, as may be necessary to correct the defect and to demonstrate that the previously defective work conforms to the requirements of this Subcontract, shall be borne by SUBCONTRACTOR.

7.19.6 SUBCONTRACTOR further warrants any and all corrective actions it performs against defects in design, equipment, materials, and workmanship for an additional period of twelve (12) months following acceptance by CONTRACTOR of the corrected Work or standard commercial warranty on product meeting standard warranty.

GC 7.20 Inspection, Quality Surveillance, Rejection of Materials and Workmanship

7.20.1 All material and equipment furnished and Work performed shall be properly inspected by SUBCONTRACTOR at its expense, and shall at all times be subject to quality surveillance and quality audit by CONTRACTOR, OWNER, or their authorized representatives who shall be afforded full and free access to the shops, factories, or other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for such quality surveillance or audit. SUBCONTRACTOR shall provide safe and adequate facilities, drawings, documents, and samples as requested, and shall provide assistance and cooperation, including stoppage of Work to perform such examination (as may be necessary) to determine compliance with the requirements of this Subcontract. Any Work covered before any scheduled quality surveillance or test by CONTRACTOR or OWNER shall be uncovered and replaced at the expense of SUBCONTRACTOR. Failure of CONTRACTOR or OWNER to make such quality surveillance or to discover defective design, materials, or workmanship shall not relieve SUBCONTRACTOR of its obligations under this Subcontract nor prejudice the rights of CONTRACTOR or OWNER thereafter to reject or require the correction of defective Work in accordance with the provisions of this Subcontract.

7.20.2 If any Work is determined by CONTRACTOR or OWNER to be defective or not in conformance with this Subcontract, the provisions of the General Condition clause titled "WARRANTY" shall apply.

GC 7.21 Testing

7.21.1 Unless otherwise provided in the Subcontract, testing of materials or Work shall be performed by SUBCONTRACTOR at its expense and in accordance with Subcontract requirements. Should tests (in addition to those required by this Subcontract) be desired by CONTRACTOR, SUBCONTRACTOR will be advised in ample time to permit such testing. Such additional tests will be at CONTRACTOR'S expense.

7.21.2 SUBCONTRACTOR shall furnish samples, as requested, and shall provide reasonable assistance and cooperation necessary to permit tests to be performed on materials or Work in place, including reasonable stoppage of Work during testing.

GC 7.22 Expediting

The material and equipment furnished and Work performed under this Subcontract shall be subject to expediting by CONTRACTOR or its representatives who shall be allowed full and free access to the shops, factories, and other places of business of SUBCONTRACTOR and its lower-tier suppliers and subcontractors for expediting purposes.

As required by CONTRACTOR, SUBCONTRACTOR shall provide detailed schedules and progress reports for use in expediting and shall cooperate with CONTRACTOR in expediting activities.

GC 7.23 Progress

- 7.23.1 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR who shall thereupon take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the currently approved Subcontract Schedule, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of Work per week, and an increase in the amount of construction plant and equipment, all without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of Work and rate of progress required by this Subcontract.
- 7.23.2 Failure of SUBCONTRACTOR to comply with CONTRACTOR'S instructions may be grounds for determination by CONTRACTOR that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate, in accordance with the applicable provisions of this Subcontract, SUBCONTRACTOR'S right to proceed with the performance of the Subcontract.

GC 7.24 Excusable Delays

If SUBCONTRACTOR'S performance of this Subcontract is prevented or delayed by any unforeseeable cause, existing or future, which is beyond the reasonable control of the parties and without the fault or negligence of SUBCONTRACTOR, SUBCONTRACTOR shall, within twenty-four (24) hours of the commencement of any such delay, give to CONTRACTOR written notice thereof and within seven (7) calendar days of commencement of the delay, a written description of the anticipated impact of the delay on performance of the Work. Delays attributable to and within the control of SUBCONTRACTOR'S suppliers or subcontractors of any tier shall be deemed delays within the control of SUBCONTRACTOR. Radiological survey time to release personnel, materials, equipment or facilities from known radiological areas shall not be considered excusable delays. Within seven (7) calendar days after the termination of any excusable delay, SUBCONTRACTOR shall file a written notice with CONTRACTOR specifying the actual duration of the delay. Failure to give any of the above notices shall be sufficient ground for denial of an extension of time. If CONTRACTOR determines that the delay was unforeseeable, beyond the control and without the fault or negligence of SUBCONTRACTOR, CONTRACTOR will determine the duration of the delay and will extend the time of performance of this Subcontract by modifying the Special Condition clause titled "COMMENCEMENT, PROGRESS, AND COMPLETION OF THE WORK," accordingly. Such extension shall be the sole remedy for the delay.

GC 7.25 Cooperation with Others

The CONTRACTOR may undertake or award other Subcontracts for other work or services. CONTRACTOR, OWNER, and other contractors may be working at the Jobsite during the performance of this Subcontract and SUBCONTRACTOR Work or use of certain facilities may be interfered with as a result of such concurrent activities. SUBCONTRACTOR shall fully cooperate with the other subcontractors and with CONTRACTOR employees. CONTRACTOR reserves the right to require SUBCONTRACTOR to schedule the order of performance of the Work to minimize interference with Work of any of the parties involved. The SUBCONTRACTOR shall not commit any act that will interfere with the performance of work by any other subcontractor or by CONTRACTOR employees.

GC 7.26 Use of Completed Portions of Work

- 7.26.1 Whenever, as determined by CONTRACTOR, any portion of the Work performed by SUBCONTRACTOR is suitable for use, CONTRACTOR or OWNER may occupy and use such portion. Use shall not constitute acceptance, relieve SUBCONTRACTOR of its responsibilities, or act as a waiver by CONTRACTOR of any of the terms of the Subcontract.

- 7.26.2 If, as a result of SUBCONTRACTOR'S failure to comply with the provisions of this Subcontract, such use proves to be unsatisfactory to CONTRACTOR or OWNER, CONTRACTOR or OWNER shall have the right to continue such use until such portion of the Work can, without injury to CONTRACTOR or OWNER, be taken out of service for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary, for such portion of the Work to comply with the Subcontract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve (12) months unless otherwise mutually agreed in writing between the parties.
- 7.26.3 SUBCONTRACTOR shall not use any permanently installed equipment unless such use is approved in writing by CONTRACTOR. When such use is approved, SUBCONTRACTOR shall at SUBCONTRACTOR'S expense, properly use and maintain and, upon completion of such use, recondition such equipment as required to meet specifications.
- 7.26.4 If CONTRACTOR or OWNER furnishes an operator for such equipment, all services performed shall be under the complete direction and control of SUBCONTRACTOR, and such operator shall be considered SUBCONTRACTOR'S employee for all purposes other than payment of such operator's wages, Worker's Compensation Insurance, or other benefits paid directly or indirectly by CONTRACTOR or OWNER.

GC 7.27 Suspension

- 7.27.1 CONTRACTOR may, by written notice to SUBCONTRACTOR, suspend at any time the performance of all or any portion of the Work to be performed under the Subcontract. Upon receipt of such notice, SUBCONTRACTOR shall, unless the notice requires otherwise:
- (a) Immediately discontinue Work on the date and to the extent specified in the notice.
 - (b) Place no further orders or subcontracts for material, services, or facilities with respect to suspended Work other than to the extent required in the notice.
 - (c) Promptly make every reasonable effort to obtain suspension upon terms satisfactory to CONTRACTOR of all orders, subcontracts and rental agreements to the extent they relate to performance of the suspended Work.
 - (d) Continue to protect and maintain the Work, including those portions on which Work has been suspended.
 - (e) Take any other reasonable steps to minimize costs associated with such suspension.
- 7.27.2 As full compensation for such suspension, SUBCONTRACTOR will be reimbursed for the following costs, excluding profit, reasonably incurred, without duplication of any item, to the extent that such costs directly result from such Work suspension:
- (a) A standby charge to be paid to SUBCONTRACTOR during the period of Work suspension, which standby charge shall be sufficient to compensate SUBCONTRACTOR for keeping, to the extent required in the suspension notice, its organization and equipment committed to the Work on a standby basis.
 - (b) All reasonable costs associated with mobilization and demobilization of SUBCONTRACTOR'S plant, forces and equipment.
 - (c) An equitable amount to reimburse SUBCONTRACTOR for the cost of maintaining and protecting that portion of the Work upon which performance has been suspended.
- 7.27.3 Upon receipt of notice to resume suspended Work, SUBCONTRACTOR shall immediately resume performance under this Subcontract to the extent required in the notice.

7.27.4 If the SUBCONTRACTOR intends to assert a claim for equitable adjustment under this clause, it must, within ten (10) calendar days after receipt of notice to resume Work, submit to CONTRACTOR a written statement setting forth the schedule impact and monetary extent of such claim in sufficient detail to permit thorough analysis. No adjustment shall be made for any suspension to the extent that performance would have been suspended, delayed, or interrupted by an SUBCONTRACTOR non-compliance with the requirements of this Subcontract.

GC 7.28 Commercial Activities

Neither SUBCONTRACTOR nor its employees shall establish any commercial activity or issue concessions or permits of any kind to third parties for establishing commercial activities on the Jobsite or any other lands owned or controlled by CONTRACTOR or OWNER.

GC 7.29 Publicity and Advertising

SUBCONTRACTOR shall not make any announcement, take any photographs, or release any information concerning this Subcontract, the Project, or any part thereof to any member of the public, press, business entity, or any official body unless prior written consent is obtained from CONTRACTOR

GC 7.30 Quality Assurance Program

7.30.1 Within thirty (30) calendar days of Subcontract award and in any event prior to commencing Work at any Work Site, SUBCONTRACTOR shall submit a Quality Assurance Program for approval consisting of the following documents:

- (a) Quality Assurance Program Manual.
- (b) Project Quality Assurance Plan.

7.30.2 The Project-specific Quality Assurance Plan (Plan) shall address all activities relevant to the Work and shall demonstrate how all work performed by SUBCONTRACTOR will conform to the Subcontract requirements. The plan shall be submitted in accordance with Exhibit I and shall contain all elements set forth in the Scope of Work.

7.30.3 The Plan shall define the documented quality system to be applied by SUBCONTRACTOR throughout the Work, in accordance with the requirements of Department of Energy (DOE) Order 414.1C.

7.30.4 The Plan shall address the interfaces between CONTRACTOR, SUBCONTRACTOR, and other relevant organizational entities. The plan shall include an organization chart showing SUBCONTRACTOR'S corporate and Project organization responsible for managing, performing and verifying the Work. The organization chart shall be supported with a reporting and functional description of SUBCONTRACTOR'S Project organization and identification of the quality-related responsibilities of key positions.

7.30.5 The Plan shall be updated as necessary throughout the Subcontract, to reflect any changes to SUBCONTRACTOR'S documented quality system. Revisions to the manual and/or Plan must be submitted to the CONTRACTOR for approval prior to implementation.

7.30.6 SUBCONTRACTOR'S documented quality system shall provide for the issuance of a "stop work" order by the SUBCONTRACTOR or CONTRACTOR at any time during the Work when significant adverse quality trends and/or deviations from the approved Quality Assurance Program are found. CONTRACTOR reserves the right to perform Quality Assurance Audits of SUBCONTRACTOR'S approved Quality Assurance Program, including lower-tier suppliers and subcontractors, at any state of the Work.

GC 7.31 SUBCONTRACTOR Employee Concerns Program

7.31.1 The SUBCONTRACTOR'S Employee Concerns Program shall conform to DOE Order 442.1 Employee Concerns Program. The CONTRACTOR reserves the right to audit the SUBCONTRACTOR'S Employee Concerns Program for compliance and implementation at any time. As directed by CONTRACTOR, the SUBCONTRACTOR shall report and correct any deficiencies as deemed necessary.

7.31.2 As a minimum, SUBCONTRACTOR shall establish an Employee Concerns Program (ECP) that ensures employee concerns related to such issues as the environment, safety, health, and management of SUBCONTRACTOR'S programs and facilities are addressed through:

- (a) prompt identification, reporting and resolution of employee concerns regarding site facilities or operations in a manner that provides the highest degree of safe operations;
- (b) free and open expression of employee concerns that results in an independent, objective evaluation;
- (c) supplementation of existing processes with an independent avenue for reporting concerns;
- (d) employees are encouraged to first seek resolution with the first line supervisors or through existing complaint or dispute resolution systems, but that they have the right to report concerns through the DOE ECP; and
- (e) management's intolerance for reprisals against or intimidation of employees who reported concerns.

As an alternative, SUBCONTRACTOR may use CONTRACTOR'S Employee Concern Program. If this is SUBCONTRACTOR'S choice, SUBCONTRACTOR will so indicate here.

7.31.3 In support of the effective implementation of the Employee Concerns Program, SUBCONTRACTOR is required to:

- (a) assist OWNER and CONTRACTOR in the resolution of employee concerns in a manner that protects the health and safety of both employees and the public and ensures effective and efficient operation of CONTRACTOR-related activities under their jurisdiction;
- (b) ensure that SUBCONTRACTOR and lower-tier Subcontractor employees, vendors/visitors are advised that they have the right and responsibility to report concerns relating to the environment, safety, health, or management of CONTRACTOR-related activities; and
- (c) cooperate with assessments used to verify that they have acted to minimize, correct, or prevent recurrence of the situation that precipitated a valid concern.

7.31.4 The SUBCONTRACTOR is responsible for compliance with the requirements made applicable to this Subcontract regardless if the Work is completed by the SUBCONTRACTOR or its subcontractors at any tier. The SUBCONTRACTOR is responsible for flowing down the necessary provisions in this Subcontract to its subcontractors at any tier.

GC 7.32 Workers Compensation Requirements

Subcontractors will be required to provide workers' compensation in accordance with the statutes of the State of Washington (Title 51, Revised Code of Washington) for performance of work under this Subcontract including work performed by lower-tier subcontractors. SUBCONTRACTOR shall be responsible for making all payments and submitting all reports required by Title 51, Section 51.32.073, and Revised Code of Washington.

GC 7.33 Insurance

Unless otherwise specified in this Subcontract, SUBCONTRACTOR shall, at its sole expense, maintain in effect at all times during the performance of the Work insurance coverage with limits not less than those set forth below with

insurers and under forms of policies satisfactory to CONTRACTOR. SUBCONTRACTOR shall deliver to CONTRACTOR no later than ten (10) calendar days after Subcontract award, but in any event before commencing the Work or entering the Jobsite, certificates of insurance as evidence that policies providing such coverage and limits of insurance are in full force and effect. Certificates shall be issued in the form provided by CONTRACTOR or if none is provided in a form acceptable to CONTRACTOR and provide that not less than thirty (30) calendar days advance written notice will be given to CONTRACTOR prior to cancellation or termination of said policies of insurance. SUBCONTRACTOR agrees to notify CONTRACTOR not less than thirty (30) days prior to any material reduction in coverage. Certificates shall identify on their face the PROJECT NAME and the applicable SUBCONTRACT NUMBER.

7.33.1 Standard Coverage:

- A. If there is an exposure or injury to CONTRACTOR'S employees under the U.S. Longshoremen's and Harbor Worker's Compensation Act, the Jones Act or under laws, regulations, or statutes applicable to maritime employees, coverage shall be included for such injuries or claims.
- B. SUBCONTRACTOR must have Employer's Liability of not less than \$1,000,000 each accident.
- C. General Liability Insurance:

1. Coverage

SUBCONTRACTOR shall carry Commercial General Liability Insurance covering all ongoing and completed operations by or on behalf of SUBCONTRACTOR providing insurance for bodily injury liability and property damage liability for the limits of liability indicated below and including coverage for:

- a. Premises and Operations;
- b. Products and Completed Operations
- c. Broad form or Blanket Contractual Liability;
- d. Broad form Property Damage (including Completed Operations);
- e. Explosion, Collapse and Underground Hazards; and
- f. Personal Injury Liability.

The Commercial General Liability insurance shall be written on an Occurrence Coverage Form.

2. Policy Limits

For SUBCONTRACTOR'S Commercial General Liability Insurance, the limits of liability for bodily injury, property damage, and personal injury shall be not less than:

- \$2,000,000 Combined single limit for Bodily Injury and Property Damage each occurrence;
- \$2,000,000 Personal Injury Limit each occurrence;
- \$4,000,000 Products-Completed Operations Annual Aggregate Limit; and
- \$4,000,000 General Annual Aggregate Limit (other than Products-Completed Operations).

If the policy does not have an endorsement providing the General Annual Aggregate limits on a per project basis, SUBCONTRACTOR shall provide an endorsement entitled "Amendment of Limits of Insurance (Designated Project or Premises)." Such endorsement shall provide for a Products-Completed Operations Annual Aggregate Limit of not less than \$5,000,000 and a General Annual Aggregate Limit of not less than \$5,000,000. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

3. Additional Insureds.

a. CONTRACTOR and OWNER and their subsidiaries and affiliates, and the officers, directors and employees of the foregoing shall be named as Additional Insureds under the Commercial General Liability Insurance policy, but only with respect to liability arising out of the operations for CONTRACTOR and OWNER by or for SUBCONTRACTOR. In the United States, Insurance Services Office (ISO) form CG 20 10 and CG 20 37 shall be attached to the policy. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insureds, be primary as regards any other coverage maintained for or by the Additional Insureds, and shall contain a cross-liability or severability of interest clause.

b. In lieu of naming CONTRACTOR and OWNER as Additional Insureds under the Commercial General Liability policy, SUBCONTRACTOR may, at CONTRACTOR'S sole discretion and not as an option, provide Owners and Contractors Protective Liability Insurance. If SUBCONTRACTOR purchases Owners and Contractors Protective Liability Insurance for the benefit of OWNER and CONTRACTOR, the policy shall have a combined single limit for Bodily Injury or Property Damage of not less than:

\$2,000,000 Each Occurrence, and
\$2,000,000 Annual Aggregate.

c. The Subcontract (the Work) shall be designated in the Policy Declarations and the policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Named Insured.

D. 1. Automobile Liability Insurance, including coverage for the operation of any vehicle, shall include, but be not limited to, owned, hired and non-owned vehicles: The combined single limit for Bodily Injury and Property Damage Liability shall be not less than \$2,000,000 for any one accident or loss. The required limits may be satisfied by a combination of a primary policy and an excess or umbrella policy.

2. SUBCONTRACTOR'S Automobile Liability Insurance shall include coverage for Automobile Contract Liability.

3. The policy shall name CONTRACTOR and OWNER, their officers, directors, and employees, as Additional Insured. Such insurance shall include an Insurer's waiver of subrogation in favor of the Additional Insured, be primary as regards any other coverage maintained for or by the "Additional Insured's, and shall contain a cross-liability or severability of interest clause.

E. In the event SUBCONTRACTOR maintains insurance covering loss or damage to equipment, tools, or any other property of SUBCONTRACTOR, such insurance shall include an Insurer's waiver of subrogation in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates.

7.33.2 Special Operations Coverage. Should any of the Work:

A. 1. Involve marine operations, SUBCONTRACTOR shall provide or have provided coverage for liabilities arising out of such marine operations, including contractual liability under its commercial General Liability Insurance or Marine Hull and Machinery Insurance, and Protection, and indemnity insurance, each with a minimum Limit of Liability of \$5,000,000. In the event such marine operations involve any SUBCONTRACTOR owned, hired, chartered, or operated vessels, barges, tugs or other marine equipment, SUBCONTRACTOR agrees to provide or have provided Marine Hull and Machinery Insurance and Protection and indemnity insurance and/or Charterer's Liability Insurance.

The combined limit of the Protection and Indemnity Insurance and/or Charterer's Liability Insurance shall be no less than the market value of the vessel or \$5,000,000, whichever is greater. The Protection and Indemnity and/or Charterer's liability and Hull and Machinery coverage shall include coverage for contractual liability, wreck removal, tower's liability, if applicable, and full collision coverage, and shall be endorsed:

- a. To provide full coverage to CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured without limiting coverage to liability "as owner of the vessel" and to delete any "as owner" clause or other language that would limit coverage to liability of an insured "as owner of the vessel;" and
- b. To waive limit to full coverage for the Additional Insured provided by any applicable liability statute.

All marine insurances provided by SUBCONTRACTOR shall include an Insurer's waiver of subrogation in favor of the Additional Insured.

2. Involve the hauling of property in excess of \$300,000, SUBCONTRACTOR shall also carry "All Risk" Transit Insurance, or "All Risk" Motor Truck Cargo Insurance, or such similar form of insurance that will insure against physical loss or damage to the property being transported, moved or handled by SUBCONTRACTOR pursuant to the terms of this Subcontract.

Such insurance shall provide a limit of not less than the replacement cost of the highest value being moved, shall insure the interest of SUBCONTRACTOR, CONTRACTOR, OWNER, and the subsidiaries and affiliates of CONTRACTOR and OWNER as their respective interests may appear and shall include an insurer's waiver of subrogation rights in favor of each.

- B. Involve aircraft (fixed or rotary wing) owned, operated, or chartered by the SUBCONTRACTOR, liability arising from such aircraft shall be insured for a combined single limit not less than \$10,000,000 each occurrence, and such limit shall apply to Bodily Injury (including passengers) and Property Damage Liability. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insureds, include an Insurer's waiver of subrogation in favor of the Additional Insureds, state that it is primary insurance as regards the Additional Insureds, and contain a cross-liability or severability of interest clause. If the aircraft hull is insured, such insurance shall provide for an Insurer's waiver of subrogation rights in favor of CONTRACTOR and OWNER and their subsidiaries and affiliates. In the event SUBCONTRACTOR charters aircraft, the foregoing insurance and evidence of insurance may be furnished by the owner of the chartered aircraft, provided the above requirements are met.
- C. Involve investigation, removal, or remedial action concerning the actual or threatened escape of hazardous substances, SUBCONTRACTOR shall also carry Pollution Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. Such insurance shall provide coverage for both sudden and gradual occurrences arising from the Work performed under this Subcontract. If Completed Operations is limited in the policy, such Completed Operation Coverage shall be for a period of not less than five (5) years. Such insurance shall include a three (3)-year extended discovery period and shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.
- D. Involve inspection, handling, or removal of asbestos, SUBCONTRACTOR shall also carry Asbestos Liability Insurance in an amount not less than \$2,000,000 per occurrence/annual aggregate. The policy shall be written on an "Occurrence Basis" with no sunset clause. Such insurance shall name CONTRACTOR and OWNER and their subsidiaries and affiliates as Additional Insured.

- E. Involve transporting hazardous substances, SUBCONTRACTOR shall also carry Business Automobile Insurance covering liability arising from transportation of hazardous materials in an amount not less than \$2,000,000 per occurrence. Such policy shall include Motor Carrier Endorsement MCS-90. NEITHER CONTRACTOR NOR OWNER IS TO BE NAMED AN ADDITIONAL INSURED FOR THIS POLICY.
- F. Involve treatment, storage, or disposal of hazardous wastes, SUBCONTRACTOR shall furnish an insurance certificate from the designated disposal facility establishing that the facility operator maintains current Environmental Liability Insurance in the amount of not less than \$5,000,000 per occurrence/annual aggregate.

7.33.3 Related Obligations

- A. The requirements contained herein as to types and limits, as well as CONTRACTOR'S approval of insurance coverage to be maintained by SUBCONTRACTOR, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by SUBCONTRACTOR under this Subcontract.
- B. The Certificates of Insurance must provide clear evidence that SUBCONTRACTOR'S Insurance Policies contain the minimum limits of coverage and the special provisions prescribed in this clause.

7.33.4 CONTRACTOR or OWNER-Furnished Insurance:

Neither CONTRACTOR nor OWNER is maintaining any insurance on behalf of SUBCONTRACTOR covering against loss or damage to the Work or to any other property of SUBCONTRACTOR unless otherwise specifically stated herein and as may be described by appendix hereto.

7.33.5 Notifications:

In accordance with the submittal requirements outlined above, SUBCONTRACTOR shall deliver the original and two (2) copies of the Certificate of Insurance required by this clause and all subsequent notices of cancellation, termination, and alteration of such policies to:

Washington Closure Hanford LLC (WCH)
2620 Fermi Avenue
Richland, WA 99354
Attention: Dana Looney _____ Mail Stop: H4-17
Subcontract No: S013213A00

8.0 THE CONTRACTOR

GC 8.1 Authorized Representatives

Before starting Work, SUBCONTRACTOR shall designate in writing an authorized representative acceptable to CONTRACTOR to represent and act for SUBCONTRACTOR and shall specify any and all limitations of such representative's authority. Such representative shall be present or be represented at the Jobsite at all times when Work is in progress, and shall be empowered to receive communications in accordance with this Subcontract on behalf of SUBCONTRACTOR. During periods when the Work is suspended, arrangements shall be made for an authorized representative acceptable to CONTRACTOR for any emergency Work that may be required. All communications given to the authorized representative by CONTRACTOR in accordance with this Subcontract shall be binding upon SUBCONTRACTOR. CONTRACTOR shall designate, in writing, one or more representatives to represent and act for CONTRACTOR and to receive communications from SUBCONTRACTOR. Notification of changes of authorized representatives for either CONTRACTOR or SUBCONTRACTOR shall be provided in advance, in writing, to the other party.

GC 8.2 Medical Examinations

- 8.2.1 CONTRACTOR shall provide all occupational medical requirements including physical examinations through the Hanford Site Occupational Medicine Provider. Subcontractors shall contact the Subcontract Technical Representative to coordinate access to site medical services. All time spent by SUBCONTRACTOR'S employees and transportation costs for medical examinations shall be at the expense of the SUBCONTRACTOR.
- 8.2.2 The SUBCONTRACTOR shall endeavor to employ only those persons who are physically qualified to perform work to which they are assigned at the jobsite with or without reasonable accommodation. If the SUBCONTRACTOR or CONTRACTOR determines that there may be a question of the person's physical fitness to safely perform work to be assigned, the SUBCONTRACTOR shall, with the approval of CONTRACTOR, require such employee to undergo a medical examination.
- 8.2.3 In any case where it is determined that a SUBCONTRACTOR employee is physically unable to perform the essential duties of the job, with or without reasonable accommodation, CONTRACTOR reserves the right to determine whether or not the employee may be assigned to work at the Jobsite and to determine any work assignment limitations to be imposed, and the SUBCONTRACTOR shall be responsible for enforcing CONTRACTOR'S decision.
- 8.2.4 The Hanford Site medical services provider at the discretion of the CONTRACTOR may review medical records.

GC 8.3 First Aid Facilities

Where CONTRACTOR or OWNER have first aid facilities at the Jobsite they may, at their option, make available their first aid facilities to treat employees of SUBCONTRACTOR who may be injured or become ill while performing the Work under this subcontract. If first aid facilities and/or services are made available to SUBCONTRACTOR'S employees, then, in consideration for the use of such facilities and the receipt of such services, SUBCONTRACTOR hereby agrees:

- (a) To release, defend, indemnify, and hold harmless CONTRACTOR, OWNER, and their authorized representatives, successors or assigns, and all of their officers and employees from and against any and all claims, demands, liabilities, including attorney's fees, arising from the receipt of such services or the use of such facilities by SUBCONTRACTOR'S employees, except for claims and demands arising out of the sole active negligence of CONTRACTOR, OWNER, or any of their representatives.
- (b) Upon receipt of any notice from CONTRACTOR or OWNER of any such claim, demand, or liability being pursued against CONTRACTOR or OWNER, to not only undertake the defense of such claim, demand or liability, but also upon entry of judgment, to make any and all payments necessary thereunder.
- (c) If any of SUBCONTRACTOR'S employees require off-site medical services, including transportation thereto, SUBCONTRACTOR shall promptly pay for such services directly to the providers thereof.

GC 8.4 Notices

Any notices provided for hereunder shall be in writing and may be served either personally on the authorized representative of the receiving party at the Jobsite or by registered mail to the address of that party, as shown on the face of the Subcontract Agreement Form or as such address may have been changed by written notice.

GC 8.5 Changes

- 8.5.1 CONTRACTOR may, at any time, without notice to the sureties, by written Change Notice, unilaterally make any change in the Work within the general scope of this Subcontract, including, but not limited to, changes:
- (a) In the drawings, designs, or specifications.

- (b) In the method, manner, or sequence of SUBCONTRACTOR Work.
- (c) In OWNER or CONTRACTOR-furnished facilities, equipment, materials, services, or site(s).
- (d) Directing acceleration or deceleration in the performance of the Work.
- (e) Modifying the Subcontract Schedule or the Subcontract Milestones.

- 8.5.2 All other changes to this Subcontract outside the scope of work shall be by written Modification signed by both parties
- 8.5.3 If an emergency occurs that endangers life or property, CONTRACTOR may use oral orders to SUBCONTRACTOR for any work required by reason of such emergency. SUBCONTRACTOR shall commence and complete such emergency work, as directed by CONTRACTOR. Such orders will be confirmed by Change Notice..
- 8.5.4 If at any time SUBCONTRACTOR believes that acts or omissions of CONTRACTOR or OWNER constitute a change to the Work not covered by a Change Notice, SUBCONTRACTOR shall within ten (10) calendar days of discovery of such act or omission submit a written Change Notice Request explaining, in detail, the basis for the request. CONTRACTOR will either issue a Change Notice or deny the request in writing.
- 8.5.5 If any change under this clause directly or indirectly causes an increase or decrease in cost of, or the time required for, the performance of any part of the Work under this Subcontract, whether or not changed by any order, an equitable adjustment shall be made and the Subcontract modified accordingly. However, SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors for increased costs in connection with any changes or delays in the Work for claims arising in tort (including negligence), or in contract except as specifically provided in this Subcontract.
- 8.5.6 If the SUBCONTRACTOR intends to assert a claim for an equitable adjustment under this clause, it must, within (10) calendar days after receipt of a Change Notice provide written notification of such intent and within a further twenty (20) calendar days, pursuant to the Special Condition clause titled "PRICING ADJUSTMENTS," submit to CONTRACTOR a written proposal in sufficient detail to permit thorough analysis and negotiation.
- 8.5.7 To facilitate prompt resolution, Requests for Equitable Adjustments, require a full and complete submittal of factual causes, contractual bases, quantified impacts, documentary evidence, and proposed resolutions from the Subcontractor. Submittals should address the following:
- (a) A description of the work performed, delayed, or impacted.
 - (b) Quantified cost and schedule impacts.
 - (c) A description of the contractual bases for entitlement.
 - (d) A description of the requested relief.
- 8.5.8 Any delay by SUBCONTRACTOR in giving notice or presenting a proposal for adjustment under this clause shall be grounds for rejection of the claim if and to the extent CONTRACTOR or OWNER are prejudiced by such delay. In no case shall a claim by SUBCONTRACTOR be considered if asserted after final payment under this Subcontract.
- 8.5.9 Failure by CONTRACTOR and SUBCONTRACTOR to agree on any adjustment shall be a dispute within the meaning of the General Condition clause titled "DISPUTES." However, SUBCONTRACTOR shall proceed diligently with performance of the work, as changed, pending final resolution of any request for relief, dispute, claim appeal, or action arising under the Subcontract and comply with any decision of CONTRACTOR.

GC 8.6 Final Inspection and Acceptance

- 8.6.1 When SUBCONTRACTOR considers the Work, or any CONTRACTOR-identified independent portion of the Work, under this Subcontract to be complete and ready for acceptance, SUBCONTRACTOR shall notify CONTRACTOR in writing. CONTRACTOR, with SUBCONTRACTOR'S cooperation, will

conduct such reviews, inspections, and tests as may be reasonably required to satisfy CONTRACTOR that the Work, or identified portion of the Work, conforms to all requirements of the Subcontract. If all or any part of the Work covered by SUBCONTRACTOR'S notice does not conform to Subcontract requirements, CONTRACTOR shall notify SUBCONTRACTOR of such nonconformance and SUBCONTRACTOR shall take corrective action and then have the nonconforming work re-inspected until all Subcontract requirements are satisfied.

8.6.2 CONTRACTOR shall issue a Notice of Provisional Acceptance for individual portions that have been satisfactorily inspected, subject only to CONTRACTOR'S Final Acceptance of the Work as a whole.

8.6.3 CONTRACTOR'S written Notice of Final Acceptance of the Work under this Subcontract shall be final and conclusive, except with regard to latent defects, fraud, or such gross mistakes as amount to fraud, or with regard to CONTRACTOR'S and OWNER'S rights under the General Condition clause titled "WARRANTY."

GC 8.7 Emergency Situation

The OWNER or designee shall have sole discretion to determine when an emergency situation exists at the Hanford Site, except for the DOE Office of River Protection Project facilities, affecting site personnel, the public health, safety, the environment, or security. The Manager, Office of River Protection (ORP), or designee has the discretion to determine whether an emergency situation exists under other ORP contract areas of work that might affect RL workers. In the event that either the RL or ORP Manager or designee determines such an emergency exists, the RL Manager or designee will have the authority to direct any and all activities of the Subcontractor and lower tier subcontractors necessary to resolve the emergency situation. The RL Manager or designee may direct the activities of the Subcontractor and lower subcontractors throughout the duration of the emergency. The Subcontractor shall include this clause in all lower-tier subcontracts for work performed at the Hanford Site.

9.0 GENERAL SUBCONTRACT PROVISIONS

GC 9.1 Applicable Law

Irrespective of the place of performance, the provisions in this Order that adopt or adapt Federal Government Acquisition Regulations (FAR) shall be construed and interpreted according to the federal common law of government contracts as enunciated and applied by federal judicial bodies, boards of contracts appeals, and quasi-judicial agencies of the federal government. To the extent that the federal common law of government contracts is not dispositive, the laws of the State of Washington shall apply.

GC 9.2 Words and Phrases

9.2.1 Where the words "as shown," or words of like import are used in this Subcontract, reference is to the drawings listed in this Subcontract unless the context clearly indicates a different meaning. Where the words "required," "approved," "satisfactory," "determined," "acceptable" or words of like import are used in this Subcontract, action by CONTRACTOR is indicated unless the context clearly indicates otherwise, and all the Work shall be in accordance therewith.

9.2.2 A requirement that a SUBCONTRACTOR-furnished document is to be submitted for or subject to "Authorization to Proceed," "Approval," "Acceptance," "Review," "Comment," or any combinations of such words or words of like import shall mean unless the context clearly indicates otherwise, that SUBCONTRACTOR shall, before implementing the information in the document, submit the document, obtain resolution of any comments and authorization to proceed. Such review shall not mean that a complete check will be performed. Authorization to proceed shall not constitute acceptance or approval of design details, calculations, analyses, tests, construction methods, or materials developed or selected by SUBCONTRACTOR and shall not relieve SUBCONTRACTOR from full compliance with requirements of the Subcontract.

9.2.3 Such action, or failure to act, shall not relieve SUBCONTRACTOR of its contractual responsibilities for performance of this Subcontract. Wherever in this Subcontract it is provided that SUBCONTRACTOR

shall perform certain Work "at its expense" or "without charge" or that certain Work "will not be paid for separately," such quoted words mean that SUBCONTRACTOR shall not be entitled to any additional compensation from CONTRACTOR for such Work, and the cost thereof shall, unless otherwise specified, be considered as included in the payment for other items of the Work.

GC 9.3 Taxes

- 9.3.1 SUBCONTRACTOR shall pay all taxes, levies, duties, and assessments of every nature in connection with the Work under this Subcontract and shall make any and all payroll deductions required by law, and hereby indemnifies and holds harmless CONTRACTOR and OWNER from any liability on account of any and all such taxes, levies, duties, assessments, and deductions.
- 9.3.2 CONTRACTOR recognizes that the tax classification established by Revised Code of Washington (RCW) 82.04.263 (currently taxed at the rate of 0.471 percent) may be applicable to the performance of all work under this Subcontract.
- 9.3.3 Subcontractor will include the above language related to Washington State B&O Tax in all sub-tier subcontracts and purchase orders.

GC 9.4 Backcharges

- 9.4.1 If, under the provisions of this Subcontract, SUBCONTRACTOR is notified by CONTRACTOR to correct defective or nonconforming Work, and SUBCONTRACTOR states or by its actions indicates that it is unable or unwilling to proceed with corrective action in a reasonable time, CONTRACTOR may, upon written notice, proceed to accomplish the redesign, repair, rework, or replacement of nonconforming Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred. Furthermore, if CONTRACTOR agrees to or is required to perform Work for SUBCONTRACTOR, such as cleanup, off-loading, or completion of incomplete Work, CONTRACTOR may, upon written notice, perform such Work by the most expeditious means available and backcharge SUBCONTRACTOR for the costs incurred.
- 9.4.2 The cost of backcharge Work shall include:
 - (a) Incurred labor costs, including all payroll additives.
 - (b) Incurred net delivered material costs.
 - (c) Incurred lower-tier supplier and subcontractor costs directly related to performing the corrective action.
 - (d) Equipment and tool rentals at prevailing rates in the Jobsite area.
 - (e) A factor of sixty percent (60%) applied to the total of items (a) through (d) for CONTRACTOR'S overhead, supervision, and administrative costs.
- 9.4.3 The backcharge notice will request SUBCONTRACTOR'S approval for CONTRACTOR to proceed with the required Work. However, failure of SUBCONTRACTOR to grant such approval shall not impair CONTRACTOR'S right to proceed with Work under this or any other provision of this Subcontract.
- 9.4.4 CONTRACTOR shall separately invoice or deduct from payments otherwise due to SUBCONTRACTOR the costs, as provided herein. CONTRACTOR'S right to backcharge is in addition to any and all other rights and remedies provided in this Subcontract or by law. The performance of backcharge Work by CONTRACTOR shall not relieve SUBCONTRACTOR of any of its responsibilities under this Subcontract, including, but not limited to, express or implied warranties, specified standards for quality, contractual liabilities and indemnifications, and the Subcontract Schedule.

GC 9.5 Examination of SUBCONTRACTOR's Record's and Accounts

SUBCONTRACTOR shall maintain a separate and distinct set of accounts and records in accordance with the General Condition entitled "DEAR 970.5232-3, Accounts, Records and Inspections (DEC 2000)." Inspection, copying, auditing and retention of such records shall be in accordance with the above General Condition and the General Condition entitled "DEAR 970.5204-3, Access To and Ownership of Records (DEC 2000)."

GC 9.6 Title to Materials Found

The title to water, soil, rock, gravel, sand, minerals, timber, and any other materials developed or obtained in the excavation or other operations of SUBCONTRACTOR or any of its lower-tier subcontractors and the right to use said materials or dispose of same is hereby expressly reserved by OWNER. Neither SUBCONTRACTOR, its lower-tier subcontractors, nor any of their representatives or employees shall have any right, title, or interest in said materials, nor shall they assert or make any claim thereto. SUBCONTRACTOR may, at the sole discretion of OWNER, be permitted, without charge, to use in the Work any such materials that meet the requirements of this Subcontract.

GC 9.7 Termination for Default

9.7.1 Notwithstanding any other provisions of this Subcontract, SUBCONTRACTOR shall be considered in default of its contractual obligations under this Subcontract if SUBCONTRACTOR:

- (a) Performs work that fails to conform to the requirements of this Subcontract.
- (b) Fails to make progress so as to endanger performance of this Subcontract.
- (c) Abandons or refuses to proceed with any of the Work, including modifications directed pursuant to the General Condition clause titled "CHANGES."
- (d) Fails to fulfill or comply with any of the terms of this Subcontract.
- (e) Engages in behavior that is dishonest, fraudulent, or constitutes a conflict of interest with SUBCONTRACTOR'S obligations under this Subcontract.
- (f) Becomes insolvent or makes a general assignment for the benefit of creditors or reasonable grounds for insecurity arise with respect to SUBCONTRACTOR'S performance.
- (g) Fails to correct an unsafe condition or noncompliance or demonstrates a persistent pattern of poor safety performance.

9.7.2 Upon the occurrence of any of the foregoing, CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the nature of the failure and of CONTRACTOR'S intention to terminate the Subcontract for default. If SUBCONTRACTOR does not cure such failure within seven (7) calendar days from receipt of notification, or sooner if safety to persons is involved, or fails to provide satisfactory evidence that such default will be corrected within a reasonable time, CONTRACTOR may, by written notice to SUBCONTRACTOR and without notice to SUBCONTRACTOR'S sureties, if any, terminate in whole or in part SUBCONTRACTOR'S right to proceed with the Work and CONTRACTOR may prosecute the Work to completion by contract or by any other method deemed expedient. CONTRACTOR may take possession of and utilize any data, designs, licenses, equipment, materials, plant, tools, and property of any kind furnished by SUBCONTRACTOR and necessary to complete the Work.

9.7.3 SUBCONTRACTOR and its sureties, if any, shall be liable for all costs in excess of the Subcontract price for such terminated work reasonably and necessarily incurred in the completion of the Work as scheduled, including cost of administration of any purchase order or subcontract awarded to others for completion.

9.7.4 Upon termination for default, SUBCONTRACTOR shall:

- (a) Immediately discontinue work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts to the extent that they relate to the performance of the terminated work.
- (b) Inventory, maintain, and turn over to the CONTRACTOR all data, designs, licenses, equipment, materials, plant, tools, and property furnished by SUBCONTRACTOR or provided by CONTRACTOR for performance of the terminated work.
- (c) Promptly obtain cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for performance of the terminated work or assign those agreements as directed by CONTRACTOR.
- (d) Cooperate with the CONTRACTOR in transfer of data, designs, licenses, and information and disposition of work in progress so as to mitigate damages.
- (e) Comply with other reasonable requests from CONTRACTOR regarding the terminated work.
- (f) Continue to perform in accordance with all of the terms and conditions of this Subcontract of such portion of the Work that is not terminated.

9.7.5 If, after termination pursuant to this clause, it is determined for any reason that SUBCONTRACTOR was not in default, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to the General Condition clause titled "TERMINATION FOR CONVENIENCE."

GC 9.8 Termination for Convenience

9.8.1 CONTRACTOR may, at its option, terminate for convenience any of the Work under this Subcontract in whole or, from time to time, in part, at any time by written notice to SUBCONTRACTOR. Such notice shall specify the extent to which the performance of the Work is terminated and the effective date of such termination. Upon receipt of such notice SUBCONTRACTOR shall:

- (a) Immediately discontinue the Work on the date and to the extent specified in the notice and place no further purchase orders or subcontracts for materials, services, or facilities, other than as may be required for completion of such portion of the Work that is not terminated.
- (b) Promptly obtain assignment or cancellation upon terms satisfactory to CONTRACTOR of all purchase orders, subcontracts, rentals, or any other agreements existing for the performance of the terminated work or assign those agreements directed by CONTRACTOR.
- (c) Assist CONTRACTOR in the maintenance, protection, and disposition of work in progress, plant, tools, equipment, property, and materials acquired by SUBCONTRACTOR or furnished by CONTRACTOR under this Subcontract.
- (d) Complete performance of such portion of the Work that is not terminated.

9.8.2 Upon any such termination, SUBCONTRACTOR shall waive any claims for damages, including loss of anticipated profits; on account thereof, but as the sole right and remedy of SUBCONTRACTOR, CONTRACTOR shall pay in accordance with the following:

- (a) The subcontract price corresponding to the work performed in accordance with this Subcontract before such notice of termination.
- (b) All reasonable costs for work thereafter performed, as specified in such notice.
- (c) Reasonable administrative costs of settling and paying claims arising from terminating work under purchase orders or subcontracts.

(d) Reasonable costs incurred in demobilization and the disposition of residual material, plant, and equipment.

(e) A reasonable overhead and profit on items (a) through (d) of this clause.

9.8.3 SUBCONTRACTOR shall submit within thirty (30) calendar days after receipt of notice of termination, a written statement setting forth its proposal for an adjustment to the subcontract price to include only the incurred costs described in this clause. CONTRACTOR shall review, analyze, and verify such proposal, and negotiate an equitable adjustment, and the Subcontract shall be modified accordingly.

GC 9.9 Non-Waiver

Failure by CONTRACTOR to insist upon strict performance of any terms or conditions of this Subcontract, or failure or delay to exercise any rights or remedies provided herein or by law, or failure to properly notify SUBCONTRACTOR in the event of breach, or the acceptance of or payment for any goods or services hereunder, or the review or failure to review designs shall not release SUBCONTRACTOR from any of the warranties or obligations of this Subcontract and shall not be deemed a waiver of any right of CONTRACTOR or OWNER to insist upon strict performance hereof or any of its rights or remedies as to any prior or subsequent default hereunder, nor shall any termination of Work under this Subcontract by CONTRACTOR operate as a waiver of any of the terms hereof.

GC 9.10 Indemnity, Fines and Penalties

9.10.1 SUBCONTRACTOR hereby releases and shall indemnify, defend, and hold harmless CONTRACTOR, OWNER, and their subsidiaries and affiliates and the officers, agents, employees, successors and assigns and authorized representatives of all the foregoing from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorney's fees, costs and expenses of whatsoever kind or nature, in connection with or incidental to the performance of this subcontract, whether arising before or after completion of the Work hereunder and in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part, or claimed to be caused, occasioned or contributed to in whole or in part, by reason of any act, omission, fault or negligence whether active or passive of SUBCONTRACTOR, its lower-tier suppliers, subcontractors or of anyone acting under its direction or control or on its behalf in connection with or incidental to the performance of this Subcontract. SUBCONTRACTOR'S aforesaid release, indemnity, and hold harmless obligations, or portions or applications thereof, shall apply to the extent of its negligence or fault and to the fullest extent permitted by law.

9.10.2 The foregoing shall include, but is not limited to, indemnity for:

(a) Property damage and injury to or death of any person, including employees of CONTRACTOR, OWNER or SUBCONTRACTOR.

(b) The breach by SUBCONTRACTOR of any representation, warranty, covenant, or performance obligation of this subcontract.

(c) Events which are directly or indirectly caused by or incident to the radioactive, toxic and/or hazardous properties of any substances.

(d) Events which arise out of any state or federal statute relating to radioactive, toxic and/or hazardous properties, such as the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) or Resource Conservation and Recovery Act of 1976 (RCRA), and shall apply to any clean-up or response costs occasioned by the transport, treatment, storage or disposal by SUBCONTRACTOR or any third party of radioactive, toxic and/or hazardous properties.

9.10.3 SUBCONTRACTOR specifically waives any immunity provided against this indemnity by an industrial insurance or workers' compensation statute.

9.10.4 SUBCONTRACTOR is liable to CONTRACTOR for fines and penalties assessed by any governmental entity against CONTRACTOR or OWNER as a result of SUBCONTRACTOR'S performance or lack of performance. SUBCONTRACTOR shall indemnify and hold harmless CONTRACTOR and OWNER from and against any and all claims, demands, actions, causes of action, suits, damages, expenses, including attorney's fees, and liabilities whatsoever resulting from or arising in any manner on account of the assessment of said fines and penalties against CONTRACTOR or OWNER.

GC 9.11 Patent and Intellectual Property Indemnity

9.11.1 In addition to FAR 52.227-4, Patent Indemnity-Construction Contracts (APR 1984), SUBCONTRACTOR hereby indemnifies and shall defend and hold harmless CONTRACTOR, OWNER, and their representatives from and against any and all claims, actions, losses, damages, and expenses, including attorney's fees, arising from any claim, whether rightful or otherwise, that any concept, product, design, equipment, material, process, copyrighted material or confidential information, or any part thereof, furnished by SUBCONTRACTOR under this Subcontract constitutes an infringement of any patent or copyrighted material or a theft of trade secrets. If use of any part of such concept, product, design, equipment, material, process, copyrighted material or confidential information is limited or prohibited, SUBCONTRACTOR shall, at its sole expense, procure the necessary licenses to use the infringing or a modified by non-infringing concept, product, design, equipment, material, process, copyrighted material or confidential information or, with CONTRACTOR'S OR OWNER'S prior written approval, replace it with substantially equal but non-infringing concepts, products, designs, equipment, materials, processes, copyrighted material or confidential information; provided, however,

(a) That any such substituted or modified concepts, products, designs, equipment, material, processes, copyrighted material, or confidential information shall meet all the requirements and be subject to all the provisions of this Subcontract.

(b) That such replacement or modification shall not modify or relieve SUBCONTRACTOR of its obligations under this Subcontract.

9.11.2 The foregoing obligation shall not apply to any concept, product, design, equipment, material, process, copyrighted material, or confidential information the detailed design of which (excluding rating and/or performance specifications) has been furnished in writing by CONTRACTOR or OWNER to SUBCONTRACTOR.

GC 9.12 Assignments and Subcontracts

9.12.1 Any assignment of this Subcontract or rights hereunder, in whole or part, without the prior written consent of CONTRACTOR shall be void, except that upon ten (10) calendar days written notice to CONTRACTOR, SUBCONTRACTOR may assign monies due or to become due under this Subcontract, provided that any assignment of monies shall be subject to proper set-offs in favor of CONTRACTOR and any deductions provided for in this Subcontract.

9.12.2 SUBCONTRACTOR shall not subcontract with any third party for the performance of all or any portion of the Work without the advance written approval of CONTRACTOR. Lower-tier subcontracts and purchase orders must include provisions to secure all rights and remedies of CONTRACTOR and OWNER provided under this Subcontract, and must impose upon the lower-tier supplier and subcontractor all of the general duties and obligations required to fulfill this Subcontract.

9.12.3 Copies of all purchase and subcontract agreements are to be provided to CONTRACTOR upon request. Pricing may be deleted unless the compensation to be paid thereunder is reimbursable under this Subcontract.

9.12.4 No assignment or subcontract will be approved that would relieve SUBCONTRACTOR or its sureties, if any, of their responsibilities under this Subcontract.

GC 9.13 Survival

The rights and obligations of the parties that by their nature survive termination or completion of this Subcontract, including, but not limited to, those set forth in the General Conditions titled "WARRANTY" and "INDEMNITY," shall remain in full force and effect.

GC 9.14 Disputes

- 9.14.1 SUBCONTRACTOR shall proceed diligently with performance of the Work, pending final resolution of any request for relief, dispute, claim, appeal, or action arising under the Subcontract, and comply with any decision of CONTRACTOR. SUBCONTRACTOR shall not be entitled to and neither CONTRACTOR nor OWNER shall be liable to SUBCONTRACTOR or its lower-tier suppliers or subcontractors in tort (including negligence), or contract except as specifically provided in this Subcontract.
- 9.14.2 Any claim for an adjustment to the Subcontract price or time of performance which cannot be resolved by negotiation shall be considered a dispute within the meaning of this clause.
- 9.14.3 If for any reason SUBCONTRACTOR and CONTRACTOR are unable to resolve a claim for an adjustment, SUBCONTRACTOR or CONTRACTOR shall notify the other party in writing that a dispute exists and request or provide a final determination by CONTRACTOR. Any such request by SUBCONTRACTOR shall be clearly identified by reference to this clause and shall summarize the facts in dispute and SUBCONTRACTOR'S proposal for resolution.
- 9.14.4 If CONTRACTOR'S final determination is not accepted by SUBCONTRACTOR the matter shall, within thirty (30) calendar days, be referred to senior executives of the parties who shall have designated authority to settle the dispute. The parties shall promptly prepare and exchange memoranda stating the issues in dispute and their respective positions, summarizing the negotiations that have taken place and attaching relevant documents.
- 9.14.5 The senior executives will meet for negotiations at a mutually agreed time and place. If the matter has not been resolved within thirty (30) calendar days of the commencement of such negotiations, the parties agree to consider resolution of the dispute through some form of Alternative Dispute Resolution (ADR) process that is mutually acceptable to the parties.
- 9.14.6 Should the parties agree to pursue an ADR process, each party will be responsible for its own expenses incurred to resolve the dispute during the ADR process.
- 9.14.7 If the parties do not agree to an ADR process or are unable to resolve the dispute through ADR, either party shall then have the right to pursue any legal remedy.

GC 9.15 Nondisclosure

- 9.15.1 SUBCONTRACTOR agrees not to divulge to third parties, without the written consent of CONTRACTOR or OWNER, any information obtained from or through CONTRACTOR or OWNER in connection with the performance of this Subcontract unless:
- (a) The information is known to SUBCONTRACTOR before obtaining the same from CONTRACTOR or OWNER;
 - (b) The information is, at the time of disclosure by SUBCONTRACTOR, then in the public domain; or
 - (c) The information is obtained by SUBCONTRACTOR from a third party who did not receive same, directly or indirectly, from CONTRACTOR or OWNER and who has no obligation of secrecy with respect thereto.
- 9.15.2 SUBCONTRACTOR further agrees that it will not, without the prior written consent of CONTRACTOR or OWNER, disclose to any third party any information developed or obtained by SUBCONTRACTOR

in the performance of this Subcontract except to the extent that such information falls within one of the categories described in (a), (b), or (c) above.

- 9.15.3 If so requested by CONTRACTOR or OWNER, SUBCONTRACTOR further agrees to require its employees to execute a nondisclosure agreement before performing any Work under this Subcontract.

GC 9.16 Procurement Integrity

- 9.16.1 The SUBCONTRACTOR warrants that it is familiar with and will comply with all the requirements of Section 27 of the Office of Federal Procurement Policy Act of 1988 (41 U.S.C. §423), as implemented in the Federal Acquisition Regulations (referred to in this clause as "the Act"), including, but not limited to (1) prohibitions on giving or offering future employment, money, or anything of value to a procurement official, (2) prohibitions on soliciting or obtaining from an agency, prior to award, any proprietary or source selection information regarding the procurement, and (3) limits on participation of former government employees and officials in negotiation and performance of government contracts. For a violation of the Act, the Government may reduce the fee or profit on the contract, terminate all or a portion of the contract for default, suspend or debar the contractor from future Federal Government work, impose fines or imprisonment, or pursue other legal remedies.
- 9.16.2 In addition to any other remedies provided by law or herein, the SUBCONTRACTOR agrees to indemnify and hold CONTRACTOR harmless to the full extent of any loss (including any reduction in fee or profit), damages, or expenses (including attorney's fees) if any of the SUBCONTRACTOR'S actions, acting alone or in concert with any other person or entity, cause the government to enforce the provisions of the Act or related regulations against CONTRACTOR.
- 9.16.3 The SUBCONTRACTOR agrees to include the substance of this clause, appropriately modified to reflect the identity and relationship of the parties, in all lower-tier subcontracts in amounts exceeding \$100,000.00.

GC 9.17 Rights in Data

When design and/or data is furnished under this Subcontract, FAR 52.227-14 applies.

GC 9.18 Continuity of Service

- 9.18.1 The SUBCONTRACTOR recognizes that the services performed under this Subcontract are vital to the OWNER and must be continued without interruption, and that, upon expiration of the Prime Contract between the OWNER and the CONTRACTOR, a successor, either the Government or another Contractor, may continue to require that the services be performed. The CONTRACTOR shall provide a sixty (60) day written notice to the SUBCONTRACTOR once the successor has been named. The SUBCONTRACTOR shall work with the OWNER and the CONTRACTOR to ensure an efficient transfer to the successor is made.
- 9.18.2 CONTRACTOR may assign this Subcontract to the OWNER or to such party as OWNER may designate to perform CONTRACTOR'S obligations hereunder. Upon receipt by SUBCONTRACTOR of written notice that the OWNER or a party so designated by the OWNER has accepted an assignment of this Subcontract, CONTRACTOR shall be relieved of all responsibility hereunder and SUBCONTRACTOR shall thereafter look solely to such assignee for performance of CONTRACTOR'S obligations.

GC 9.19 Government Flowdowns

The Federal Acquisition Regulation (FAR), the Department of Energy (DOE) FAR Supplement (DEAR) clauses, and the DOE Procurement Regulations incorporated herein shall have the same force and effect as if printed in full text. Upon request, CONTRACTOR will make their full text available. Wherever necessary to make the context of the FAR and DEAR clauses applicable to this Subcontract, the term "Contractor" shall mean "SUBCONTRACTOR," the term "Contract" shall mean this Subcontract, and the term "Government," Contracting Officer" and equivalent phrases shall mean the CONTRACTOR'S representative, except the terms "Government" and Contracting Officer"

do not change: (1) in the phrases "Government Property," "Government-Furnished Property," and "Government-Owned Property"; (2) in the patent clauses incorporated herein; (3) when a right, act, authorization or obligation can be granted or performed only by the Government's duly authorized representative; (4) when title to property is to be transferred directly to the Government; (5) when access to proprietary financial information or other proprietary data is required except for authorized audit rights; and (6) where specifically modified herein.

9.19.1 Applicable to All Subcontracts

CLAUSE	TITLE
52.222-1	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)
52.223-3	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (JAN 1997) – ALT 1 (JUL 1995)
522.22	PRIVACY ACT NOTIFICATION (APR 1984)
52.224-2	PRIVACY ACT (APR 1984)
52.225-11	BUY AMERICAN ACT – CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS AND NORTH AMERICAN FREE TRADE AGREEMENT (JUN 1997)
52.225-13	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (DEC 2003)
52.227-4	PATENT INDEMNITY-CONSTRUCTION CONTRACTS (APR 1984)
52.242-13	BANKRUPTCY (JUL 1995)
52-244-6	SUBCONTRACTS FOR COMMERCIAL ITEMS (JUL 2004)
952.203-70	WHISTLEBLOWER PROTECTION FOR CONTRACTOR EMPLOYEES (DEC 2000)
952.204-2	SECURITY (MAY 2002)
952.208-70	PRINTING (APR 1984)
952.217-70	ACQUISITION OF REAL PROPERTY (APR 1984)
952.227-82	RIGHTS TO PROPOSAL DATA (APR 1994)
970.5223-4	WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (DEC 2000)
970-5232-3	ACCOUNTS, RECORDS, AND INSPECTION (DEC 2000)
CRD M 442.1-1	DIFFERING PROFESSIONAL OPINIONS MANUAL FOR TECHNICAL ISSUES INVOLVING ENVIRONMENT, SAFETY AND HEALTH
CRD O 450.1A	ENVIRONMENTAL PROTECTION PROGRAM

9.19.2 Applicable to Subcontracts over \$2,000 Where the Davis-Bacon Act Applies

CLAUSE	TITLE
52.222-6	DAVIS-BACON ACT (FEB 1995)
52.222-7	WITHHOLDING OF FUNDS (FEB 1988)
52.222-8	PAYROLLS AND BASIC RECORDS (FEB 1988)
52.222-9	APPRENTICES AND TRAINEES (FEB 1988)
52.222-10	COMPLIANCE WITH COPELAND REGULATIONS (FEB 1988)
52.222-11	SUBCONTRACTS LABOR STANDARDS (FEB 1988)
52.222-12	CONTRACT TERMINATION-DEBARMENT (FEB 1988)
52.222-13	COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
52.222-14	DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
52.222-15	CERTIFICATION OF ELIGIBILITY (FEB 1988)
52.222-16	APPROVAL OF WAGE RATES (FEB 1988)
53.222(e)	APPLICATION OF LABOR LAWS TO GOVERNMENT ACQUISITIONS
952.222-39	NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES (DEC 2004)

CLAUSE	TITLE
970.5223-1	INTEGRATION OF ENVIRONMENT, SAFETY AND HEALTH INTO WORK PLANNING AND EXECUTION

9.19.3 Applicable to Subcontracts over \$2,500

CLAUSE	TITLE
52.222-3	CONVICT LABOR (JUN 2003)

9.19.4 Applicable to Subcontracts over \$2,500 Where the Service Contract Act Applies

CLAUSE	TITLE
52.222-41	SERVICE CONTRACT ACT OF 1965, AS AMENDED (MAY 1989)

9.19.5 Applicable to Subcontracts over \$3,000

CLAUSE	TITLE
52.222-54	EMPLOYMENT ELIGIBILITY VERIFICATION

9.19.5 Applicable to Subcontracts over \$10,000

CLAUSE	TITLE
52.222-21	PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)
52.222-26	EQUAL OPPORTUNITY (APR 2002)
52.222-36	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

9.19.6 Applicable to Subcontracts over \$25,000

CLAUSE	TITLE
52.222-35	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)
52.222-37	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA AND OTHER ELIGIBLE VETERANS (DEC 2001)

9.19.7 Applicable to Subcontracts over \$100,000

CLAUSE	TITLE	INSTRUCTIONS
52.203-6	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)	
52.203-7	ANTI-KICKBACK PROCEDURES (JUL 1995)	Add to (c)(2): "Seller shall notify Buyer when such action has been taken." In the first sentence of (c)(4) 'the Contract Officer may...' is replaced by 'after the Contracting Officer has effected an offset at the prime contract level or has directed Buyer to withhold any sum from the Seller, Buyer shall...'
52.203-10	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)	
52.203-12	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 2003)	

CLAUSE	TITLE	INSTRUCTIONS
52.215-2	AUDIT AND RECORDS – NEGOTIATIONS (JUNE 1999)	
52.219-8	UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2001)	
52.222-4	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT – OVERTIME COMPENSATION (SEP 2000)	
52.223-14	TOXIC CHEMICAL RELEASE REPORTING (AUG 2003)	
52.227-1	AUTHORIZATION AND CONSENT (JUL 1995)	
52.227-2	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)	

9.19.8 Applicable to Subcontracts over \$500,000

CLAUSE	TITLE
52.230-6	ADMINISTRATION OF COST ACCOUNTING STANDARDS (NOV 1999) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)
952.226-74	DISPLACED EMPLOYEE HIRING PREFERENCE (JUNE 1997)
970.5226-2	WORKFORCE RESTRUCTURING UNDER SECTION 3161 OF THE NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 1993 (DEC 2000)
52.219-9	SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002) ALTERNATIVE II (OCT 2001) Threshold for Construction is \$1,000,000. (Does not apply to small business or those instances where subcontracting opportunities are not available at the time of award.)

9.19.9 Applicable to Subcontracts over \$550,000

CLAUSE	TITLE
52.215-10	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA (OCT 1997)
52.215-11	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-13	SUBCONTRACTOR COST OR PRICING DATA – MODIFICATIONS (OCT 1997)
52.215-15	PENSION ADJUSTMENTS AND ASSET REVERSIONS (JAN 2004)
52.215-18	REVERSION OR ADJUSTMENT OF PLANS FOR POST RETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS (OCT 1997)
52.215-19	NOTIFICATION OF OWNERSHIP CHANGES (OCT 1997)

9.19.10 Applicable to Subcontracts over \$650,000

CLAUSE	TITLE
52.230-2	COST ACCOUNTING STANDARDS (APR 1998) (unless exempted by 48 CFR 9903.201-1 and 9903.201-2)

9.19.11 Applicable to Subcontracts Where Nuclear Hazards May Exist

CLAUSE	TITLE
952.223-75	PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)
952.250-70	NUCLEAR HAZARDS INDEMNITY AGREEMENT (OCT 2005)

9.19.12 Applicable to Subcontracts Where Government Property is Provided

CLAUSE	TITLE
52.244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-AND-MATERIAL, OR LABOR-HOUR CONTRACTS) (MAY 2004)
52.244-1	PROPERTY RECORDS (APR 1984) (Only applicable when WCH maintains the official property records.)
52.245-25	LIMITATION OF LIABILITY – SERVICES (FEB 1997)
952-244-5	GOVERNMENT PROPERTY (COST REIMBURSEMENT, TIME-MATERIAL, OR LABOR-HOUR CONTRACTS)

9.19.13 Applicable to Subcontracts Where Technical Data or Computer Software will be Produced, Furnished or Acquired

CLAUSE	TITLE
52.227-14	RIGHTS IN DATA GENERAL (JUNE 1987) ALTERNATIVE V (JUNE 1987) AS MODIFIED PURSUANT TO DEAR 927.409 (a)

9.19.14 Applicable to Cost Reimbursement Subcontracts

CLAUSE	TITLE	INSTRUCTIONS
52.216-7	ALLOWABLE COST AND PAYMENT (DEC 2002)	(a) (3) 30 days
52.216-8	FIXED FEE (MAR 1997)	
52.242-1	NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)	
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)	
52.244-2	SUBCONTRACTS (AUG 1998) – ALTERNATE II (AUG 1998)	
952.216-7	ALLOWABLE COST AND PAYMENT (JAN 1997) – ALTERNATE II	
952.251-70	CONTRACTOR EMPLOYEE TRAVEL DISCOUNTS (JUNE 1995)	
970.5204-3	ACCESS TO AND OWNERSHIP OF RECORDS (DEC 2000)	(b)(1) through (b)(5) are Subcontractor-owned records.

9.19.15 Applicable to Time and Material Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002)
52.24215	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)

9.19.16 Applicable to Labor-Hour Subcontracts

CLAUSE	TITLE
52.232-7	PAYMENTS UNDER TIME-AND-MATERIALS AND LABOR-HOUR CONTRACTS (DEC 2002) ALTERNATE II (FEB 2002)
52.242-15	STOP-WORK ORDER (AUG 1989) – ALTERNATE I (APR 1984)

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EXHIBIT "B"

SPECIAL CONDITIONS

CONSTRUCTION SUBCONTRACTS

**ERDF SUPER CELLS 9 & 10 CONSTRUCTION QUALITY
ASSURANCE (CQA)**

SUBCONTRACT NUMBER S013213A00

**EXHIBIT B
SPECIAL CONDITIONS
CONSTRUCTION SUBCONTRACT**

WASHINGTON CLOSURE HANFORD LLC

TABLE OF CONTENTS

SC	Title	Page No.
1.0	SCOPE	1
2.0	DEFINITIONS	1
3.0	TERMS OF PAYMENT	1
SC 3.1	RESERVED	1
SC 3.2	RESERVED	1
SC 3.3	MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK	1
SC 3.4	EXPENDITURE NOTIFICATION.....	4
SC 3.5	PRICING ADJUSTMENTS	5
4.0	THE SUBCONTRACTOR.....	7
SC 4.1	POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES	7
SC 4.2	Reserved	7
SC 4.3	SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES	7
SC 4.4	COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK	10
SC 4.5	SUBCONTRACT SCHEDULE.....	12
SC 4.6	Reserved	14
SC 4.7	SECURITY AND HAZARD COMMUNICATION PROGRAMS.....	14
SC 4.8	Reserved	14
SC 4.9	SUBCONTRACTOR KEY PERSONNEL	15
SC 4.10	RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE.....	15
SC 4.11	Reserved	16
5.0	THE CONTRACTOR	16
SC 5.1	CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS	16
SC 5.2	CONTRACTOR-FURNISHED UTILITIES AND SERVICES	16
SC 5.3	CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT	17
SC 5.4	CONTRACTOR-FURNISHED PERMITS	18
SC 5.5	AUTHORITY OF PERSONNEL.....	18
SC 5.6	DISPOSITION OF CONTAMINATED MATERIAL	20
6.0	GENERAL SUBCONTRACT PROVISIONS	19
SC 6.1	WORK HOURS AND FACILITY CLOSURE DAYS.....	19
SC 6.2	WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL.....	20
SC 6.3	SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION.....	20
SC 6.4	INCREMENTAL FUNDING OF SUBCONTRACT	20
SC 6.5	TECHNICAL DIRECTION	22
SC 6.6	TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY).....	23
SC 6.7	INTEGRATED WORK CONTROL PROGRAM.....	25
SC 6.8	SAFETY INCENTIVE.....	25

1.0 SCOPE

This Exhibit B provides Special Terms and Conditions that apply specifically to this Subcontract and SUBCONTRACTOR providing construction technical services to Washington Closure Hanford LLC.

2.0 DEFINITIONS

"CONTRACTOR" means Washington Closure Hanford LLC (WCH) and all of its authorized representatives acting in their professional capacities in performance of OWNER'S Contract No. DE-AC06-05RL14655. To the extent that the CONTRACTOR is not the ultimate user of the services required herein, all rights, benefits and remedies conferred by Subcontractor shall also accrue and be available to and are for the express benefit of the OWNER for which the Services are required.

"JOBSITE" and "SITE" means the location(s) at which or for which the Services will be provided.

"OWNER" means the United States Department of Energy (DOE) / United States Government.

"WORK" and "SERVICES" means all technical and professional Services and responsibilities to be performed by the SUBCONTRACTOR as specified, stated, indicated or implied in the Master Agreement Subcontract or Job Order, including the furnishing and supervision of all technical personnel and the supply of all equipment, materials and supplies necessary or required to perform the Master Agreement Subcontract or Job Order.

"SUBCONTRACTOR" means the company, corporation, partnership, individual or other entity to which the Master Agreement Subcontract or Job Order is issued, its authorized representatives, successors, and permitted assigns.

"PROGRAM" means the performance of the requirements of Contract No. DE-AC06-05RL14655

"SUBCONTRACT TECHNICAL REPRESENTATIVE" is designated by the CONTRACTOR as the individual responsible for the technical aspects of the performance of the Subcontract.

"SUBCONTRACT SPECIALIST" is designated by the CONTRACTOR as the individual responsible for administering the Subcontract terms and conditions and who acts as CONTRACTOR's authorized representative.

3.0 TERMS OF PAYMENT

SC 3.1 RESERVED

SC 3.2 RESERVED

SC 3.3 MEASUREMENT FOR PAYMENT AND PAYMENT FOR WORK

- 3.3.1 For the purpose of arriving at agreement on the basis for progress payments for items bid as lump sum, SUBCONTRACTOR shall, within fifteen (15) calendar days after award, submit a proposed breakdown of values of the various elements of the Work comprising the lump sum item. Such submittal shall also include a proposed schedule of monthly progress payments. The proposed breakdown and payment schedule shall be correlated with the schedule and reports required by the Special Condition entitled "SUBCONTRACT SCHEDULE". Such breakdown and payment schedule shall be subject to CONTRACTOR'S approval.

- 3.3.2 Estimates shall be prepared by SUBCONTRACTOR and submitted in writing for CONTRACTOR'S approval on or about the end of each month covering the amount and value of Work satisfactorily performed by SUBCONTRACTOR up to the date of such estimate. Such estimate may be made by strict measurement, or by estimate, or partly by one method and partly by another. Estimates shall be based on cumulative total quantities of Work performed. Estimates may include materials or equipment not incorporated into the Work. The quantity of Work to be paid for under any item for which a unit price is fixed in the Subcontract shall be the amount or number, approved by CONTRACTOR, of units of Work satisfactorily completed in accordance with this Subcontract and computed in accordance with applicable measurement for payment provisions of this Subcontract.
- 3.3.3 SUBCONTRACTOR shall make all surveys necessary for determining quantities of Work to be paid for under this Subcontract. Copies of field notes, computations, and other records made by SUBCONTRACTOR to determine quantities shall be furnished to CONTRACTOR upon request. SUBCONTRACTOR shall notify CONTRACTOR before such surveys are made.
- 3.3.4 CONTRACTOR, at its discretion, may arrange to have its representative witness and verify surveys made by SUBCONTRACTOR for determining quantities of Work to be paid for under this Subcontract. Measurements and computations shall be made by such methods as CONTRACTOR may consider appropriate for the class of Work measured, and the estimate of quantities of Work completed shall be compatible with the reporting requirements required hereunder by the Special Condition titled "SUBCONTRACT SCHEDULE". The dividing limits, lines, or planes between adjacent items or classes of excavation, concrete, or other types of Work where not definitely indicated on the drawings or in the specifications shall be as determined by CONTRACTOR.
- 3.3.5 Review by CONTRACTOR of SUBCONTRACTOR'S estimate of the amount and value of the Work performed will be within ten (10) calendar days of its receipt and a copy of the estimate as approved returned to SUBCONTRACTOR. SUBCONTRACTOR shall prepare and submit to CONTRACTOR an invoice in accordance with the estimate as approved. SUBCONTRACTOR shall certify in each application for payment that there are no known outstanding mechanic's or material-men's liens and that all due and payable bills have been paid or are included in the application for payment. Such certification shall be on the CONTRACTOR furnished "Request for Payment (Construction Subcontracts)" form that may be down-loaded from www.wch-rcc.com. In addition, an Electronic Funds Transfer (EFT) form is provided to allow payments to be forwarded to the SUBCONTRACTOR'S bank account electronically. The EFT form will need to be completed by the CONTRACTOR and the CONTRACTOR'S bank. The bank needs to return the form to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attn: Accounts Payable

- 3.3.6 Reserved
- 3.3.7 CONTRACTOR may, as a condition precedent to any such payment to SUBCONTRACTOR, require SUBCONTRACTOR to submit complete waivers and releases of all claims of any person, firm, or corporation in connection with or in any way related to the performance of this Subcontract. Upon request, SUBCONTRACTOR shall also furnish acceptable evidence that such claims have been satisfied.
- 3.3.8 SUBCONTRACTOR shall submit, as required by CONTRACTOR, on a monthly basis, an accurate current and complete list of open purchase orders and subcontracts which include contact information (name and telephone number). CONTRACTOR reserves the right to use the contact information to verify prompt payment by SUBCONTRACTOR.

3.3.9 Any amounts otherwise payable under this Subcontract may be withheld, in whole or in part, if:

- (a) Any claims are filed against SUBCONTRACTOR by CONTRACTOR, OWNER or third parties, or if reasonable evidence indicates the probability of filing any such claims; or
- (b) SUBCONTRACTOR is in default of any Subcontract condition including, without limitation, the schedule, quality, and safety requirements; or
- (c) There is reasonable doubt that this Subcontract can be completed within the time specified or for the balance then unpaid; or
- (d) SUBCONTRACTOR has not submitted:
 - 1. Schedules and progress reports, as defined in the Special Condition titled "SUBCONTRACT SCHEDULE",
 - 2. Property insurance certificates, or not provided proper coverage or proof thereof,
 - 3. Its safety, security, and fire prevention plans, or
 - 4. Waivers and Releases or Waivers and Releases submitted with invalid information.
 - 5. Certified copies of payroll records required that are up to date to within two (2) weeks of the date SUBCONTRACTOR submits any invoice for payment.

3.3.10 CONTRACTOR will pay such withheld payments if SUBCONTRACTOR:

- (a) Pays, satisfies, or discharges any claim of CONTRACTOR, OWNER, or third parties against SUBCONTRACTOR arising out of or in any way connected with this Subcontract; or
- (b) Cures all defaults in the performance of this Subcontract.

3.3.11 If claims filed against SUBCONTRACTOR connected with performance under this SUBCONTRACT are not promptly removed by SUBCONTRACTOR after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may remove such claims and deduct all costs in connection with such removal from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. If the amount of such withheld payment or other monies due SUBCONTRACTOR is insufficient to meet such costs, or if any claim against SUBCONTRACTOR is discharged by CONTRACTOR after final payment is made, SUBCONTRACTOR shall promptly pay CONTRACTOR all costs incurred thereby, regardless of when such claim arose or whether such claim imposed a lien upon the Project or the real property upon which the Project is situated.

3.3.12 If CONTRACTOR is notified that SUBCONTRACTOR has failed to pay valid invoice submitted by sub-tier supplier or subcontractor in accordance with the payment terms of a valid sub-tier subcontract or purchase order for expenditures made under the scope of work of the SUBCONTRACT, SUBCONTRACTOR shall promptly pay such invoice. If invoices are not promptly paid by SUBCONTRACTOR within seven (7) days after receipt of written notice from CONTRACTOR to do so, CONTRACTOR may pay such invoices directly to the sub-tier supplier or subcontractor and deduct all costs in connection with such payment from withheld payments or other monies due, or which may become due, to SUBCONTRACTOR. CONTRACTOR also reserves the right to require SUBCONTRACTOR to submit separate invoices for any or all sub-tier subcontractors or suppliers and to make payment to the sub-tier supplier or subcontractor on behalf of SUBCONTRACTOR.

- 3.3.13 If a lien is filed, SUBCONTRACTOR shall remove the lien, or see that it is removed or shall furnish a bond for the full amount thereof within seven (7) calendar days of notice by CONTRACTOR. SUBCONTRACTOR shall obtain for itself legally effective waivers of lien and furnish same to CONTRACTOR with each application for payment. Failure to comply with the foregoing requirements shall constitute grounds for termination of this Subcontract in accordance with the General Condition titled, "TERMINATION FOR DEFAULT".
- 3.3.14 Upon receipt by SUBCONTRACTOR of CONTRACTOR'S written notice of Final Acceptance of the Work under this Subcontract, SUBCONTRACTOR shall prepare an estimate in writing for CONTRACTOR's approval of the amount and value of all Work satisfactorily completed under this Subcontract. Upon CONTRACTOR's approval of such estimate, SUBCONTRACTOR shall prepare and submit its final invoice in accordance with the approved estimate. Unless otherwise specified by applicable law, CONTRACTOR shall, within sixty (60) calendar days following Final Acceptance and after submittal of such invoice, pay to SUBCONTRACTOR the amount then remaining due, provided that, SUBCONTRACTOR shall have furnished CONTRACTOR and OWNER for itself, its subcontractors, immediate and remote, and all material suppliers, vendors, laborers, and other parties acting through or under it, waivers and releases of all claims against CONTRACTOR or OWNER arising under or by virtue of this Subcontract, except such claims, if any, as may with the consent of CONTRACTOR and OWNER be specifically excepted by SUBCONTRACTOR from the operation of the release in stated amounts to be set forth therein.
- 3.3.15 No payments of invoices or portions thereof shall at any time constitute approval or acceptance of Work under this Subcontract, nor be considered to be a waiver by CONTRACTOR or OWNER of any of the terms of this Subcontract. However, title to all material and equipment for which payment has been made, whether or not the same has been incorporated in the Work, and title to all completed Work whether paid for or not, shall vest in CONTRACTOR, or OWNER as the case may be, and in any case shall not be part of SUBCONTRACTOR'S property or estate in the event SUBCONTRACTOR is adjudged bankrupt or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of SUBCONTRACTOR'S insolvency.
- 3.3.16 Invoices for monthly progress payments and final payment should be signed and submitted along with a completed and signed "Request for Payment (Construction Subcontracts)" form in one (1) original copy to:

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Accounts Payable
Reference: Subcontract Number: **S013213A00**

SC 3.4 EXPENDITURE NOTIFICATION

- 3.4.1 SUBCONTRACTOR shall furnish to the address below the best estimate of the total billable cost (invoiced and invoiceable) from Award of the Subcontract through the current calendar month end. This information must be submitted in writing (facsimile acceptable) no later than the 15th of each month.

Washington Closure Hanford LLC
2620 Fermi Avenue
Richland, WA 99354
Attention: Subcontract Specialist
Dana Looney (509) 372-9499
Fax: (509) 372-9049.

- 3.4.2 For Work performed on a unit-rate basis, SUBCONTRACTOR shall notify the CONTRACTOR'S Subcontract Specialist in writing when SUBCONTRACTOR expects that in the next sixty (60) calendar days billable charges, when added to all previously billed charges, will exceed seventy-five percent (75%) of the estimated Subcontract value shown in Exhibit "C". Upon expending seventy-five percent (75%) of the estimated Subcontract value, SUBCONTRACTOR shall provide the CONTRACTOR'S authorized representative with weekly written summaries of billable charges, inclusive of previously billed charges.
- 3.4.3 The CONTRACTOR is not obligated to reimburse the SUBCONTRACTOR for billable charges in excess of the estimated Subcontract value, as modified. The SUBCONTRACTOR is not obligated to continue performance under this Subcontract once billable charges reach one hundred percent (100%) of the estimated Subcontract value, as modified.

SC 3.5 PRICING ADJUSTMENTS

When costs are a factor in any determination of a Subcontract adjustment pursuant to the General Condition titled, "CHANGES", or any other provision of this Subcontract unless excluded therein, such direct and indirect costs, upward or downward, for labor, equipment, and material necessary to perform the Work of the Change shall be determined in accordance with the following:

- 3.5.1 Determination of direct labor hours for changes involving added or deleted work shall be as follows:
- (a) Direct labor hours necessary to perform the Work or the Change shall be established by applying standards from the most recent edition of *Building Construction Cost Data* (Means), published by R. S. Means Company, Inc.; or other CONTRACTOR-approved data-base, as may have been previously developed by SUBCONTRACTOR.
 - (b) In addition to direct payroll costs, direct labor costs shall include payroll taxes and insurance, vacation allowance, subsistence, travel allowance, overtime premium and any other payroll additives required to be paid by SUBCONTRACTOR by law or labor agreement(s) (e.g., Department of Labor Wage Determination, bargaining agreements such as the Hanford Site Stabilization Agreement, etc.).
 - (c) Charges for labor furnished and used by SUBCONTRACTOR shall include all manual classifications up to and including foremen. Labor rates used to calculate the costs shall be those rates in effect during accomplishment of the change. Charges shall not be included for superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics. These charges will be included in the indirect rate as set forth below.
- 3.5.2 Determination of direct costs of equipment for changes involving added or deleted work shall be as follows:
- (a) Allowable equipment costs of in-use or stand-by SUBCONTRACTOR-owned equipment will be computed by utilizing eighty percent (80%) of the rates set forth in the most current *Rental Rate Blue Book for Construction Equipment* (hereinafter referred to as the Blue Book), found at www.equipmentwatch.com, as adjusted for age of equipment in Region "F" provided such rates exclude unallowable or unacceptable costs in accordance with FAR 31.105. Hourly rates will be developed by using monthly rates divided by 166.7 hours based on a 4 day/10 hour per day work schedule...
 - 1. In-use or operating equipment rates will be developed by calculating the depreciation, major overhaul, and cost of facilities capital (CFC) portion of the Blue

Book rates. Blue Book indirect costs will not be allowed (they should be included as indirect rates as set forth below). The estimated operating cost per hour for consumables, including, but not limited to, maintenance labor and parts, fuel, oil, filters, lubricants, and tires will be allowed.

2. Stand-by equipment rates will be developed by calculating the CFC portion and one-half the depreciation portion of the Blue Book rate element table allowance. Blue Book indirect costs and major overhaul costs will not be allowed. The estimated operating cost per hour for consumables, including but not necessarily limited to, maintenance labor and parts; fuel, oil, filters, lubricants, and tires can not be included.
 - (b) Equipment costs of in-use or stand-by SUBCONTRACTOR-rented equipment shall be computed as follows: CONTRACTOR shall develop "market rates" commensurate with rates from equipment rental firms for similar equipment within the area. Should SUBCONTRACTOR-proposed rates not be comparative, CONTRACTOR reserves the right to delete unreasonable charges.
 - (c) When the equipment is operated infrequent and such equipment need not remain at the site of the Work continuously, as determined by the CONTRACTOR, charges shall be limited to actual hours of use. Equipment not operating, but retained at the jobsite at CONTRACTOR'S direction, shall be charged at the standby rate.
- 3.5.3 Direct costs of materials for changes involving added or deleted work shall be determined in the following ways:
- (a) From published supplier pricing data or written quotes from suppliers on specific items where published pricing data is not generally available (invoices from suppliers are acceptable); or
 - (b) From standards published in Means, or other CONTRACTOR-approved data previously developed by SUBCONTRACTOR if information identified in paragraph (a) above is not available.
- 3.5.4 When pricing adjustments, the following are considered to be included as indirect costs, and as such may not be considered, and will not be compensated, as direct costs. Jobsite office expenses, incidental job burdens, small tools, general office overhead allocation, and costs for estimating the price of changed work.
- 3.5.5 The following shall apply to determine the indirect cost portion of Subcontract Price adjustments. CONTRACTOR recognizes Washington State business and occupation (B&O) tax rate of RCW 82.04.263 (currently 0.471 percent) as applicable to price adjustments to this Subcontract. Paragraphs (a), (b), and (c) below will apply when the adjustment does not meet the criteria for submittal of Certified Cost and Pricing data. **It must be emphasized that indirect rates in the paragraph (b) and (c) below are maximum rates and CONTRACTOR reserves the right to negotiate the indirect expense rates within the ceiling limitations.**
- (a) SUBCONTRACTOR'S and lower-tier subcontractor's overhead and profit shall be considered to include the following: insurance cost; small tools having a purchase price of \$500.00 or less; incidental job burdens; general home office expenses commonly known as G&A; labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics, as well as any other items specified for Overhead and Operations in Exhibit C. Unless otherwise stated, no separate allowance will be made and costs of premium adjustments, consequent upon changes ordered, for Payment and Performance Bonds (allowable for SUBCONTRACTOR only).

Note labor costs for project managers, engineers, supervisor (including QA and Safety), superintendents, assistant superintendents, general foremen, surveyors, office personnel, timekeepers and maintenance mechanics are included in overhead & profit when the change notice occurs in the timeframe of the subcontract baseline schedule. If the change notice takes place outside the baseline schedule (i.e. added scope) then direct labor charges for these types of personnel are allowed.

- (b) Overhead and Profit allowance for SUBCONTRACTOR or lower-tier subcontractors on work performed by lower-tier subcontractors shall be calculated as follows: a maximum mark-up of ten percent (10%) shall be applied to the aggregate of sub-tier subcontractor charges less than or equal to \$25,000; a maximum mark-up of seven and one-half percent (7 ½%) shall be applied to the aggregate of sub-tier subcontractor charges greater than \$25,000 but less than or equal to \$650,000; a maximum mark-up of five percent (5%) or \$100,000, whichever is less shall be applied to the aggregate of sub-tier subcontractor charges greater than \$650,000.
- (c) For parties performing the Work, overhead and profit on changes shall be calculated not to exceed the following: ten percent (10%) overhead and ten percent (10%) profit on total direct costs up to \$25,000; seven and one-half percent (7 ½%) overhead and seven and one-half percent (7 ½%) profit on total direct costs over \$25,000.00, but less than \$650,000; five percent (5%) of total direct costs or \$100,000 whichever is less, for overhead and profit combined on total direct costs over \$650,000.
- (d) Overhead and profit shall be calculated utilizing the net increase in price of the change after deductions have been taken.
- (e) Credit for overhead and profit shall be included as part of the downward adjustment for a deductive change.

3.5.6 Any change in excess of \$650,000 will require cost and pricing data as part of the proposal for the change.

4.0 THE SUBCONTRACTOR

SC 4.1 POTENTIALLY DISTRACTIVE WRITTEN MATERIAL AND DEVICES

4.1.1 Within ten (10) working days of Subcontract execution and prior to commencement of any Work, SUBCONTRACTOR shall submit a written procedure or policy that prohibits written material that does not relate to operation (including, but not limited to newspapers and magazines) and entertainment devices (including, but not limited to televisions, tape players, and computer games) from use by on-duty operations personnel in order to minimize distractions from their responsibilities.

4.1.2 Appropriate non-work related materials may be brought to the lunch/break rooms but may not be used while personnel are on duty. Music may be played at a volume that does not distract personnel from safe execution of the Work.

SC 4.2 RESERVED

SC 4.3 SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES

4.3.1 SUBCONTRACTOR shall submit drawings, data, samples, and other submittals in accordance with Exhibit "I", "Subcontractor Submittal Requirements Summary," of this Subcontract.

CONTRACTOR will require a fourteen (14) calendar day review period for drawings, data, samples, and other submittals.

4.3.2 Review and permission to proceed by CONTRACTOR, as stated in this Special Condition, does not constitute acceptance or approval of design details, calculations, analyses, test methods, certificates, or materials developed or selected by SUBCONTRACTOR and does not relieve SUBCONTRACTOR from full compliance with contractual obligations. Drawing categories and their associated requirements include, but are not limited to, the following:

4.3.2.1 Issued for Construction (IFC) Drawings may be required for:

- Fabrication of SUBCONTRACTOR-furnished equipment,
- Installing SUBCONTRACTOR-furnished material or equipment,
- Planning and performance of the Work under this Subcontract
- Installing energized utility systems.

IFC drawings shall be prepared by the SUBCONTRACTOR in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." The drawings shall be submitted by and at the expense of SUBCONTRACTOR before fabrication, installation, or performance is commenced, allowing at least fourteen (14) calendar days for review by CONTRACTOR unless otherwise shown on the Subcontract Schedule. IFC drawings submitted by the SUBCONTRACTOR and reviewed by CONTRACTOR shall form a part of this Subcontract. Such drawings shall include, but not be limited to, matchmarks, erection diagrams, and other details, such as field connections for proper installation, erection of the equipment, and performance of the Work.

Drawings submitted by SUBCONTRACTOR shall be certified by SUBCONTRACTOR to be correct, shall show the Subcontract number, and shall be furnished in accordance with the Subcontract Submittal Requirements Summary (SSRS) form(s).

Design changes to the IFC drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.2 Samples:

Samples, if required, shall be submitted by and at the expense of SUBCONTRACTOR. Such submittals shall be made not less than thirty (30) calendar days before the time that the materials represented by such samples are needed for incorporation into the Work. Samples shall be subject to review and materials represented by such samples shall not be manufactured, delivered to the Jobsite, or incorporated into the Work without such review.

Each sample shall bear a label showing SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, brand name, model number, supplier's name, and reference to the appropriate drawing number, technical specification section and paragraph number, as applicable.

Samples that have been reviewed may, at CONTRACTOR'S option, be returned to SUBCONTRACTOR for incorporation into the Work.

4.3.2.3 Data and Certificates:

Four (4) copies of each required certificate shall be submitted by and at the expense of SUBCONTRACTOR. Such submittal shall be made not less than thirty (30) calendar days before the time that the materials represented by such certificates are needed for incorporation into the work. Certificates shall be subject to review, and material represented by such certificates shall not be fabricated, delivered to the jobsite, or incorporated into the Work without such review.

Certificates shall clearly identify the material being certified and shall include, but not be limited to, providing the following information: SUBCONTRACTOR'S name, Project name, Subcontract number, name of the item, manufacturer's name, and reference to the appropriate drawing, technical specification selection and paragraph number, as applicable.

4.3.2.4 Working Drawings and Design Changes:

During construction, the SUBCONTRACTOR shall keep an up-to-date set of working drawings on the jobsite as an accurate record of deviations between Work as shown on the IFC drawings and Work as installed. These drawings shall be available to CONTRACTOR and OWNER for inspection. The working drawings, including any initial as-built drawings, shall be available for inspection at the SUBCONTRACTOR's field office at the jobsite.

Design changes to the IFC drawings, including the redlining process, shall be made in accordance with the Technical Specification 000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.5 As-Built Drawings:

The SUBCONTRACTOR shall provide the as-built information submittals as described below and as detailed in Exhibit I.

4.3.2.5.1 Required Submittals. The SUBCONTRACTOR shall, at its expense, furnish to the CONTRACTOR the following submittals:

- Initial as-built drawings for energized utility systems. Drawings shall show the energized utility system configuration at the time it was placed into service.
- Final as-built drawings for all IFC and initial as-built drawing.

The content, level of detail, accuracy of location and format of the as-built drawings shall be in accordance with the Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings." Design change process for initial as-built and final as-built drawings shall be in accordance with Technical Specification 0000X-SP-X0001.

4.3.2.5.2 Submittal Schedule. SUBCONTRACTOR shall furnish the as-builts drawing submittals in accordance with the schedule below:

- Initial as-built drawing for electrical utility systems – Due not later than thirty (30) calendar days after final energization of the system.
- Initial as-built drawings for non-electrical utility systems – Due not later than thirty (30) calendar days after installation is complete. CONTRACTOR approval of the as-built submittal is required prior to using the non-electrical utility.
- Final as-built drawings for all work including energized utility systems due not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment.

4.3.2.6 As-Built Specifications:

SUBCONTRACTOR shall, at its expense and not later than thirty (30) calendar days from and after Final Acceptance and before Final Payment, furnish to CONTRACTOR a complete set of marked-up, final as-built specifications with FINAL AS-BUILT clearly printed on the cover and associated electronic file. SUBCONTRACTOR shall accurately and neatly transfer all annotations from progress as-builts to final as-builts.

Deviations from specifications must be supported by Request for Information (RFI), Supplier Deviation Disposition Request (SDDR), or Design Change Notice (DCN).

4.3.2.7 Electronic Files:

As-built drawings submittals shall be prepared using acceptable and compatible software as determined by the CONTRACTOR. Submittal documents shall be delivered in the quantities as specified in Exhibit I and accompanied by an electronic media version.

4.3.2.7.1 Specifications: Textual material shall be converted to Microsoft Word and shall have a ".doc" extension.

4.3.2.7.2 Drawings: Design drawings shall be prepared by SUBCONTRACTOR in accordance with Technical Specification, 0000X-SP-X0001, "Subcontractor Prepared Design Drawings."

4.3.2.8 Energized Systems:

Energized systems include, but are not limited to, the following:

- Electric Power and Control Systems (except telephone and computer systems)
- Pressurized piping systems
- Sanitary and process sewer systems

The SUBCONTRACTOR shall submit approved design and "as-built" information for energized systems (including detailed routing of above and below grade components) to the WCH Project Engineer as described above in the titled section "As-built Drawings." For electrical utility installations, the SUBCONTRACTOR shall have a "Hold Point" clearly stated in their work procedures/instructions requiring an NEC Inspection prior to final energizing of the affected system(s). The SUBCONTRACTOR shall have the current up-to-date working drawings for the system available for the NEC inspector's use. The final energization inspection shall only be undertaken by the NEC inspector if the working drawings are current and correctly show the configuration of the work to be inspected.

SC 4.4 COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK

4.4.1 SUBCONTRACTOR shall complete the Work under the Subcontract to meet the following Subcontract Milestones measured in calendar days from Notice to Proceed (NTP) with on-site Work of the Subcontract:

ERDF CELLS 9 & 10 CQA			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Complete Mobilization Submittals	Subcontract Award	30
2.	Submit Cell 9 Final Certification Report	Subcontract	4/01/2011

		Award	
3.	Submit Cell 10 Final Certification Report	Subcontract Award	9/01/2011
4.	Complete Demobilization	Subcontract Award	9/29/2011

CONTRACTOR will make available to the SUBCONTRACTOR the construction schedule provided by the ERDF Construction Subcontractor within 25 days after the award of ERDF Construction Subcontract. The SUBCONTRACTOR shall plan and ensure adequate resources are available in accordance with this schedule.

The following milestones were set by CONTRACTOR for the ERDF Construction Subcontract. SUBCONTRACTOR shall use these milestones only for bidding and resource planning purposes.

ERDF CELLS 9 & 10 CONSTRUCTION			
ITEM No.	MILESTONE DESCRIPTION	START	FINISH
1.	Submit Bonding and Insurance	Subcontract Award	10
2.	Complete Mobilization Submittals	Subcontract Award	30
3.	Cell 9 Excavation	Per S/C schedule	4/1/2010
4.	Admix Test Pad	Per S/C schedule	4/15/2010
5.	Complete Cell 10 North and South Embankments	Per S/C schedule	6/1/2010
6.	Cell 9 Admix Placement	Per S/C schedule	7/12/2010
7.	Cell 10 Excavation	Per S/C schedule	8/1/2010
8.	Remove Covers and Clean Existing Leachate Tanks	Per S/C schedule	8/1/2010
9.	New Covers on Existing Leachate Tanks	Per S/C schedule	10/1/2010
10.	Cell 9 Liner & Leachate Collection Systems	Per S/C schedule	10/1/2010
11.	Cell 10 Admix Placement (Admix Placement South of Sump and Admix Winter Protection)	Per S/C schedule	11/1/2010
12.	Cell 9 Operations Layer	Per S/C schedule	11/15/2010
13.	Revegetate Stockpiles	11/1/2010	12/31/2010
14.	Cell 9 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	12/1/2010
15.	Leachate Transmission Pipeline (pipeline, manholes, electrical)	Per S/C schedule	2/1/2011
16.	Leachate Tank No. 3	Per S/C schedule	2/1/2011
17.	Cell 9 Acceptance Testing	Per S/C schedule	3/1/2011
18.	Cell 10 Admix Placement (Admix Placement in Sump and North Slope & Remove Winter Protection)	Per S/C schedule	4/1/2011
19.	Cell 10 Crest Pad Building (building, electrical, mechanical)	Per S/C schedule	4/1/2011
20.	Cell 10 Liner & Leachate Collection Systems	Per S/C schedule	7/1/2011
21.	Cell 10 Operations Layer	Per S/C schedule	9/1/2011
22.	Cell 10 Acceptance Testing	Per S/C schedule	8/1/2011

4.4.2 SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans for performing each part of the Work. If at any time, SUBCONTRACTOR'S actual progress is inadequate to meet the requirements of this Subcontract, CONTRACTOR may notify SUBCONTRACTOR to take such steps as may be necessary to improve its progress. If within a reasonable period as determined by CONTRACTOR, SUBCONTRACTOR does not improve performance to meet the Subcontract Milestones set forth above, CONTRACTOR may require an increase in SUBCONTRACTOR'S labor force, the number of shifts, overtime operations, additional days of work per week, expedited shipment(s) of equipment and materials, and an increase in the amount of construction plant and equipment, without additional cost to CONTRACTOR. Neither such notice nor CONTRACTOR'S failure to issue such notice shall relieve SUBCONTRACTOR of its obligation to achieve the quality of work and rate of progress required by this Subcontract.

4.4.3 Noncompliance with CONTRACTOR'S instructions shall be grounds for CONTRACTOR'S determination that SUBCONTRACTOR is not prosecuting the Work with such diligence as will assure completion within the times specified. Upon such determination, CONTRACTOR may terminate this Subcontract pursuant to the General Condition clause titled "TERMINATION FOR DEFAULT."

SC 4.5 SUBCONTRACT SCHEDULE

4.5.1 SUBCONTRACTOR shall, within fifteen (15) calendar days of Subcontract award, submit to CONTRACTOR for approval the Subcontract Schedule consisting of a detailed schedule meeting the milestone dates established in the Special Condition titled "COMMENCEMENT, PROGRESS AND COMPLETION OF THE WORK." This approved Subcontract schedule is the Project Baseline Schedule. No progress payments will be made until the SUBCONTRACTOR'S schedule has been accepted by the CONTRACTOR and annotated as a Status "1". The Subcontract Schedule shall be based on a critical path analysis of activities (as applicable) and sequence of operations needed for the orderly performance and completion of any separable parts of and all the Work in accordance with this Subcontract. The Subcontract Schedule shall be a resource loaded Critical Path Method (CPM) type in the form of a precedence diagram and activity listing. The schedule shall contain sufficient detail to identify critical schedule activities, CONTRACTOR interface, submittals required, inspection points, deliverables, and any other information pertinent to the performance of this Subcontract.

4.5.2 The Subcontract Schedule shall show in detail and in order of sequence, all activities, their descriptions, durations, production rate variances and dependencies, necessary and required to complete the Work, and any separable parts thereof. In addition to Milestones shown in SC 4.4.1 the following (minimum) list shall be included as specific activities:

4.5.3 The activity listing shall show the following information for each activity on the Subcontract Schedule:

1. Identification by activity numbers and descriptions
2. Craft (manpower) and equipment resource loaded activity sheets for Project Baseline Schedule
3. Early start and finish dates
4. Late start and finish dates
5. Identify any float time
6. Identify and describe any suspension of work, if applicable

4.5.4 The Subcontract Schedule shall be complete, covering activities at the Jobsite, off-site activities such as design, fabrication, procurement and jobsite delivery of SUBCONTRACTOR-furnished

equipment, and the scheduled Jobsite delivery dates of equipment to be furnished by CONTRACTOR, if any, and shall include a personnel forecast by crafts. SUBCONTRACTOR shall give CONTRACTOR full information in advance as to its plans (resources, production rates, logistics/methodology, requirement for Radiological Control Technicians (RCTs), and CONTRACTOR deliverables) required for performing each separable part of Work.

- 4.5.5 The Subcontract schedule and revisions must be submitted in an electronic format compatible with Primavera Project Planner, Version 2.0 or later industry updates (WINDOWS) or as coordinated with CONTRACTOR. SUBCONTRACTOR shall promptly inform CONTRACTOR of any proposed change in the schedule and narrative and shall furnish CONTRACTOR with a revised schedule and narrative within ten (10) calendar days after approval by CONTRACTOR of such change.
- 4.5.6 The schedule and narrative shall be kept up to date, taking into account the actual Work progress and shall be revised, if necessary, every thirty (30) calendar days. The revised schedule and narrative shall, as determined by CONTRACTOR, be sufficient to meet the requirements to complete the separable parts of any and all of the Work, as set forth in this Subcontract.
- 4.5.7 During the performance of the Work, SUBCONTRACTOR shall submit to CONTRACTOR periodic progress reports in duplicate on the actual progress. Such reports shall be furnished as CONTRACTOR may request.

4.5.8 Such progress reports shall include the following:

- 1. Quarterly Chemical Inventory, (See Exhibit G and Exhibit J)
- 2. Monthly Accident and injury report summary, as required by Exhibit "A". General Condition titled SAFETY AND HEALTH, and Exhibit "G" Subcontractors Safety and Health Requirements, titled "Reporting Accidents and Incidents".
- 3. Monthly A copy of the Subcontract Schedule outlining progress to date for the major parts of the Work, as compared to scheduled progress, no later than the end of the month.
- 4. Monthly A comparison between planned and actual personnel by craft for Work performed to date, as required by CONTRACTOR.
- 5. Monthly A detailed and complete financial report in spreadsheet format showing as a minimum, current month. Past months, future month projections of pay item billings, percents of work complete by pay item no later than 10 working days after the end of each month.
- 6. Weekly A three-week look-ahead schedule showing forecast personnel by craft (if different from the original construction plan).
- 7. Weekly A three-week look-ahead schedule showing forecast progress of the Work, detailing discreet elements of work within each subcontract schedule activity, including forecast of personnel by craft, as required by CONTRACTOR.
- 8. Weekly A weekly report of quantities completed on items of the Work, as required by CONTRACTOR.
- 9. Weekly A weekly update of the estimate of labor hours for each activity or operation, as

required by CONTRACTOR.

10. Daily A daily force report listing all personnel by craft and Work performed by them,

SC 4.6 RESERVED

SC 4.7 SECURITY AND HAZARD COMMUNICATION PROGRAMS

4.7.1 A Security Program shall be submitted in writing to CONTRACTOR for approval and coordination with other Jobsite activities within thirty (30) days after Subcontract award, and in any event prior to commencing Work at the Jobsite. Such Program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, and shall include:

4.7.1.1. Controlled access to office, warehouse, material and equipment sites.

4.7.1.2 Accountability procedures for the requisition and issue of materials.

4.7.1.3 Periodic security checks for all work areas assigned to SUBCONTRACTOR.

4.7.1.4 Prompt reporting of incidents of loss, theft or vandalism to CONTRACTOR, subsequently detailed in writing.

4.7.1.5 Coordination and compliance with Site security programs.

4.7.2 A Hazard Communication Program shall be submitted in writing to the CONTRACTOR for approval and coordination with other jobsite activities within thirty (30) days after Subcontract award or prior to commencing work at the Jobsite. Such program shall be commensurate with the specific requirements of the CONTRACTOR'S AND/OR OWNER'S requirements, (See Exhibit "G", Safety and Health Requirements), and shall include Identification of Hazard Communication Program responsibility and accountability. The Hazard Communication Program shall ensure:

4.7.2.1 Receipt and document control of Material Safety Data Sheets (MSDS) for materials being brought onto the Jobsite by the SUBCONTRACTOR or its suppliers and subtiers.

4.7.2.2 Employee training on MSDS's and in the handling and disposal of materials that fall under statutory regulations.

4.7.2.3 A disposal plan for removal of hazardous materials from the Jobsite. This plan must meet all federal/national, state and other applicable governmental requirements.

4.7.3 Subcontractor and all of Subcontractor's lower-tier subcontractors shall identify supervisory point(s) of contact (POCs) that will be on site whenever Subcontractor's/or lower-tier subcontractor's personnel are on site. The POC is responsible for notifying Subcontractor's personnel when an "Event Notification" occurs.

Event Notification will be broadcast on the WCH Intranet and via text messages to all POCs. The POC shall carry a cell phone at all times that is capable of sending and receiving text messages and the cell phone number shall be provided to the STR and kept up-to-date at all times.

SC 4.8 RESERVED

SC 4.9 SUBCONTRACTOR KEY PERSONNEL

- 4.9.1 CONTRACTOR reserves the right to approve all Key Personnel. SUBCONTRACTOR'S key personnel must be assigned full-time onsite to this Subcontract exclusively and possess the minimum qualifications listed below. SUBCONTRACTOR shall not reassign or remove key personnel without prior written authorization of CONTRACTOR. Whenever, for any reason, one or more of these individuals are unavailable for assignment for Work under this Subcontract, any replacement key personnel shall possess the minimum qualifications and experience required for the position.
- 4.9.2 When the CONTRACTOR finds that a correlation exists or appears to exist between a documented lack of SUBCONTRACTOR performance and a lack of SUBCONTRACTOR employee qualification performance and/or falsification of experience requirements, the SUBCONTRACTOR agrees to immediately replace that individual with another employee with the minimum qualifications appropriate to the work being performed as specified above at no additional cost to the CONTRACTOR.

CQA OFFICER

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.1 requirements.

CQA ENGINEER AND PROJECT MANAGER (FULLTIME ON SITE POSITION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.2 requirements.

BENTONITE ADMIX LANDFILL LINER CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING ADMIX PUGMILL SET UP, TEST PAD, OPERATION, AND PLACEMENT)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

GEOSYNTHETICS CQA TECHNICIAN (FULLTIME ON SITE POSITION DURING GEOSYNTHETICS INSTALLATION)

- Per the CQA Plan (Document 0600X-QA-G0005) Section 3.3 requirements.

SC 4.10 RECEIPT OF SUBCONTRACTOR'S MATERIAL AND/OR EQUIPMENT AT SITE

- 4.10.1 SUBCONTRACTOR shall not schedule materials and/or equipment for delivery to the Jobsite until such time as it is mobilized to receive and accept property at the Jobsite. CONTRACTOR reserves the right to require survey of any materials/equipment for presence of hazardous or radioactive substances before bringing the equipment/material into or from the Jobsite. Any deficiencies shall be corrected or replaced at SUBCONTRACTOR'S expense.
- 4.10.2 SUBCONTRACTOR is not permitted to use CONTRACTOR'S mailing address and in no case shall material or equipment be addressed in care of CONTRACTOR. It is recognized that special conditions may exist that would warrant assistance in the delivery of equipment or materials by CONTRACTOR. However, the SUBCONTRACTOR must have explicit prior written authorization from CONTRACTOR.

SC 4.11 RESERVED

5.0 THE CONTRACTOR

SC 5.1 CONTRACTOR-FURNISHED DRAWINGS AND SPECIFICATIONS

- 5.1.1 CONTRACTOR will furnish specifications and design drawings for each part of the Work under this Subcontract. SUBCONTRACTOR shall, immediately upon receipt thereof, check all specifications and drawings furnished and shall promptly notify CONTRACTOR of any omissions or discrepancies in such specifications or drawings.
- 5.1.2 All specifications and drawings listed in Exhibit "E", SPECIFICATIONS and Exhibit "F", DRAWINGS are a part of this Subcontract. "Issued for Award" (IFA) specifications and drawings will be issued at the time of award and become a part of the Subcontract, superseding or supplementing the original drawings. SUBCONTRACTOR shall perform Work only in accordance with drawings marked IFA. If SUBCONTRACTOR considers such issue to be a change affecting cost or schedule, SUBCONTRACTOR must request an equitable adjustment in accordance with the General Condition titled "CHANGES."
- 5.1.3 SUBCONTRACTOR shall perform Work only in accordance with IFA drawings and any subsequent revisions thereto, and with CONTRACTOR reviewed drawings submitted by SUBCONTRACTOR in accordance with the Special Condition titled "SUBCONTRACTOR-FURNISHED DRAWINGS, DATA AND SAMPLES."
- 5.1.4 The CONTRACTOR shall maintain control of all electrical drawings. The SUBCONTRACTOR shall provide appropriate design and as-built to the CONTRACTOR for incorporation into the drawings.
- 5.1.5 One (1) copy of such specifications, and One (1) full size reproducible copy, and One (1) full size prints of such drawings will be furnished to SUBCONTRACTOR without charge. Any additional copies of such specifications and drawings will, upon SUBCONTRACTOR'S request, be furnished to SUBCONTRACTOR at the actual cost thereof.

SC 5.2 CONTRACTOR-FURNISHED UTILITIES AND SERVICES

- 5.2.1 Utilities. The utilities listed below and specifically detailed in the Specifications or Statement of Work, as applicable, will be furnished by CONTRACTOR without cost to SUBCONTRACTOR, provided that all such utilities will be furnished at outlets existing on the Jobsite and SUBCONTRACTOR shall, at its expense, extend such utilities from said outlets to points of use and at completion of all the Work remove all materials and equipment used for such extensions.
 - 5.2.1.1 Water for construction
 - 5.2.1.2 Potable water
 - 5.2.1.3 Electrical services
 - 5.2.1.4 Telecommunication lines
- 5.2.2 Services. The CONTRACTOR shall determine whether the services listed below, if required under this Subcontract, will be furnished by CONTRACTOR to support performance of Work by SUBCONTRACTOR.
 - 5.2.2.1 Services of Non-Building Trades, bargaining craft Radiological Control Technicians (RCTs) who are members of the Hanford Atomic Metals Trades Council (HAMTC) to perform radiological monitoring.

5.2.2.2 CONTRACTOR will provide Radiological Dosimetry Services and Records, and Occupational Medical Services and Records.

5.2.3 Facilities. The facilities listed below will be furnished by CONTRACTOR. Such facilities may be used by SUBCONTRACTOR without charge therefore, provided that any such use will be subject to written approval of CONTRACTOR.

5.2.3.1 Office and Laboratory Testing Trailer with the following characteristics:

- Three offices (12' x 9' minimum)
- Laboratory space (21x16 space and including shelving). Electrical outlets will be provided in each office area, hallways, and at least six 110v outlets and one 220v outlet will be provided in the laboratory area.
- Daily janitorial service (trash service, vacuuming, mopping, etc.) provided by the CONTRACTOR.
- Office/lab trailer utilities (HVAC, electrical, etc.) will be provided and maintained by CONTRACTOR.

5.2.3.2 Temporary toilet facility with separate areas for males and females.

5.2.3.1 Jobsite parking area – The CONTRACTOR will designate an area near the operation for SUBCONTRACTOR personnel vehicle parking.

SUBCONTRACTOR shall be responsible for testing equipment, office supplies (copiers, computers, consumables, internet service, telecommunications, etc.), and furniture (including flammable storage cabinets).

SC 5.3 CONTRACTOR-FURNISHED MATERIALS AND EQUIPMENT

5.3.1 CONTRACTOR will furnish to SUBCONTRACTOR, at CONTRACTOR'S warehouse or Jobsite storage area, the items listed below to be incorporated into or used in performance of the Work under this Subcontract. Such items will be furnished, without cost to SUBCONTRACTOR, provided that SUBCONTRACTOR shall, at its expense, accept delivery thereof, load, unload, transport to points of use and care for such items until final disposition thereof. At time of acceptance of any such item from CONTRACTOR, SUBCONTRACTOR shall sign a receipt therefore. Signing of such receipt without reservation therein shall preclude any subsequent claim by SUBCONTRACTOR that any such items were received from CONTRACTOR in a damaged condition and with shortages. SUBCONTRACTOR shall account for such material and equipment in accordance with FAR 52.245.1 (June 2007). If at any time after acceptance of any such item from CONTRACTOR any such item is damaged, lost, stolen, or destroyed, such item shall be repaired or replaced at the expense of SUBCONTRACTOR. Items required to be replaced may, at its option, be furnished by CONTRACTOR. Upon completion of all the Work under this Subcontract, SUBCONTRACTOR shall, at its expense, return all surplus and unused items to CONTRACTOR'S warehouse or Jobsite storage area.

5.3.2 CONTRACTOR will exert every reasonable effort to make delivery of such materials and equipment so as to avoid delay in the progress of the Work. However, should CONTRACTOR, for any reason, fail to make delivery of any such item and a delay shall result, SUBCONTRACTOR shall be entitled to no additional compensation or damages on account of such delay. The only adjustment that will be made will be the granting of an appropriate extension of time.

SC 5.4 CONTRACTOR-FURNISHED PERMITS

The General Condition titled "PERMITS AND LICENSES" notwithstanding, CONTRACTOR will without cost to the SUBCONTRACTOR; furnish the permits required for performance of work on the Hanford Site. SUBCONTRACTOR shall, in accordance with said General Condition titled "PERMITS AND LICENSES", provide all other permits. All such CONTRACTOR-furnished permits are available for examination at the project office of CONTRACTOR during regular business hours.

SC 5.5 AUTHORITY OF PERSONNEL

- 5.5.1 The CONTRACTOR will designate a Subcontract Specialist to administer the Subcontract terms and conditions and act as the CONTRACTOR'S authorized representative. Additionally, all correspondence shall be issued and received by the designated Subcontract Specialist. Unless further delegated, in writing, by the Subcontract Specialist as set forth below, the only individual authorized to direct the SUBCONTRACTOR to deviate from the express, written terms of the Subcontract is the authorized Subcontract Specialist.
- 5.5.2 The CONTRACTOR will designate a Subcontract Technical Representative (STR) who will be responsible for the technical aspects of the performance of the Subcontract. The STR may designate other personnel to oversee the performance of the Work, sign field tickets, etc. However, the designated STR retains ultimate authority over the technical aspects of the Work. Should the SUBCONTRACTOR and STR disagree over the technical requirements of the Subcontract; such matters will be immediately referred to the CONTRACTOR'S Subcontract Specialist for resolution. Subcontract Specialist may advise SUBCONTRACTOR of further delegation of his/her authority as set forth above. Unless so advised, STR does not possess authority, express or implied, to direct the SUBCONTRACTOR to deviate from the terms and conditions of the Subcontract.

SC 5.6 DISPOSITION OF CONTAMINATED PROPERTY

- 5.6.1 The SUBCONTRACTOR is expected to bring equipment that is readily decontaminated. The SUBCONTRACTOR agrees to submit to CONTRACTOR for survey any equipment, tools, or other personal property brought into any Radiological Areas by the SUBCONTRACTOR, its employees, and any of its subcontractors and their employees.
- 5.6.2 The necessary survey to detect contamination will be performed immediately before removing any property from any location within the Jobsite Controlled Access Area or area specified by the CONTRACTOR. The SUBCONTRACTOR shall notify CONTRACTOR not less than three (3) working days before each property (including equipment and tools) removal.
- 5.6.3 The CONTRACTOR'S intent is to work with the SUBCONTRACTOR to release all SUBCONTRACTOR'S equipment through the efforts of equipment placement (minimization of contact) and decontamination efforts on affected equipment pieces (i.e., buckets, tracks, beds). Because of the known inventory of constituents within the excavation areas, CONTRACTOR cannot guarantee the full release of SUBCONTRACTOR'S equipment or parts thereof.
- 5.6.4 Any equipment, except for treatment equipment designed and intended to come into direct contact with contaminated material, that cannot be decontaminated or free released (radiological) in a timely manner will not be released back to the SUBCONTRACTOR and becomes the property of the CONTRACTOR/OWNER. At the sole discretion of the CONTRACTOR, additional compensation to the SUBCONTRACTOR may be made for the contaminated equipment.

5.6.5 In any event, the SUBCONTRACTOR shall be responsible for all CONTRACTOR and SUBCONTRACTOR costs incurred when contamination of equipment/material results from violation of CONTRACTOR'S Radiological Control Program.

5.6.6 Prior to release of any equipment, SUBCONTRACTOR shall consult with CONTRACTOR to determine whether decontamination is necessary.

6.0 GENERAL SUBCONTRACT PROVISIONS

SC 6.1 WORK HOURS AND FACILITY CLOSURE DAYS

6.1.1 Site Work Hours

6.1.1.1 Site Work hours are from 6:00 a.m. to 4:30 p.m. Monday through Friday (5 days per week, 10/hours per day). SUBCONTRACTOR shall be onsite when the Construction Subcontractor is performing work requiring Construction Quality Assurance (CQA) oversight. Deviation from the approved Site work hours shall be requested in writing from the CONTRACTOR and such approval shall not be unreasonably withheld, but shall be at the Contractor's discretion. The Subcontractor should plan to observe the same facility closure days as the CONTRACTOR.

CONTRACTOR recognizes the following Facility Closure days:

New Year's Day	Labor Day
*Presidents Day	Thanksgiving Day
Memorial Day	Day before Thanksgiving
Independence Day	Christmas Day
*Day before or after Christmas	

*Facility closure is not applicable to Building Trades Craft

Note: In the event a Facility Closure Day falls on a weekend (Friday, Saturday, or Sunday), it will be observed on an otherwise scheduled work day.

6.1.1.2 SUBCONTRACTOR is responsible for contacting the Subcontract Technical Representative with support requirements on Facility Closure dates with a 72-hour advance written notice to the CONTRACTOR. The SUBCONTRACTOR shall not perform any work at the jobsite on any Facility Closure Day without CONTRACTOR approval in advance.

6.1.1.3 SUBCONTRACTOR shall take into consideration that the above work schedule may be deviated from based upon the official Department of Energy, Richland Operations Office (RL) process for declaring changes to the Hanford Site work schedule due to inclement weather conditions. SUBCONTRACTOR shall have the sole responsibility for satisfying itself concerning the general and local conditions, including, but not limited to, climatic conditions and seasons.

6.1.2 Notification System

There are three primary methods used to notify employees and subcontractors when site conditions necessitate a site closure, delay in the start of work, or early release from work.

6.1.2.1 Subcontractor employees may request their Subcontract Specialist or Subcontractor Technical Representative submit their name, cell phone number, and cell phone provider to the WCH text messaging notification system. In the event there are site

closures, for any reason, the recipient will receive a text message providing the information.

6.1.2.2 Subcontractor employees may refer to the WCH External Website. In the event of delays or site closures, a banner will be posted on the website.

6.1.2.3 Subcontractor employees may phone 372-9002 for emergency or site closure information.

6.1.3 Variable Conditions May Affect Site Areas Differently

6.1.3.1 Due to the size of the Hanford Site, adverse weather conditions may affect separate parts of the site differently. In these cases, the work delay/early release may only apply to those employees and/or Subcontractors working in the most affected areas. In the event a project needs an individual to be present onsite during adverse weather, CONTRACTOR shall notify SUBCONTRACTOR.

6.1.3.2 When the start of work is delayed due to inclement weather conditions, the adjusted start time is intended to give employees and/or Subcontractors adequate time to arrive at work safely. Arriving ahead of the adjusted start time could jeopardize the completion of maintenance work, and could put the employee at risk in terms of unsafe road conditions and/or unsafe walking surfaces at the work place. If a decision is made for an early release of employees and/or Subcontractors from work due to severe weather conditions, the CONTRACTOR will notify the SUBCONTRACTOR.

SC 6.2 WORK AND OPERATIONS AT SITE REQUIRING SPECIFIC APPROVAL

6.2.1 Working Hours:

The SUBCONTRACTOR shall not perform Work at the Jobsite on other than the Site Work hours specified in subparagraph 6.1.1 above, unless it has given prior written notification to CONTRACTOR and has received approval in advance, as provided in this Special Condition.

6.2.2 Notification:

The SUBCONTRACTOR shall give CONTRACTOR at least four (4) hours prior notice if its employees are to be working after the site work hours specified in SC 6.1.1. The SUBCONTRACTOR shall give CONTRACTOR notice on the prior working day if its employees will be working before the site work hours specified in SC 6.1.1, or will be working at any time on Saturday, Sunday, or holidays. The notice shall include the type of Work to be performed, location of Work, date and hours of Work, and description of any heavy equipment to be used. CONTRACTOR advance approval is required any time Work is to be performed at other than normal shift periods.

SC 6.3 SUBCONTRACT PERFORMANCE PERIOD, PRICING AND OPTIONS FOR EXTENSION

The Subcontract Performance Period shall commence on the date of Award of the Subcontract and extend through and including September 30, 2011.

SC 6.4 INCREMENTAL FUNDING OF SUBCONTRACT

The CONTRACTOR'S obligation to pay the Subcontract price in accordance with Section entitled, "Measurement for Payment and Payment for Work", of the Subcontract Special Conditions is subject to the provisions and limitations further set forth by the following. The CONTRACTOR'S obligation under this

Subcontract is hereby limited notwithstanding any provision of the "Measurement for Payment and Payment for Work" section or any other section or provision of this Subcontract.

- 6.4.1 Allotment of Funds: Of the total Subcontract price, only specific portions of the total amount are estimated to be available, allotted by FY, for this Subcontract. The CONTRACTOR shall not be obligated under this Subcontract to the SUBCONTRACTOR on any theory or basis for total payment in excess of total allotments up to that time. Furthermore, the SUBCONTRACTOR is not to expend any effort on Work for which the CONTRACTOR has not provided the SUBCONTRACTOR written authorization to proceed.

CONTRACTOR shall notify SUBCONTRACTOR of the estimated amount of funding to be available for each subsequent FY. It is contemplated, but not warranted, that the full amount of estimated funds for each FY's allotment will be available by October 1st, of each FY. CONTRACTOR shall notify SUBCONTRACTOR, in writing, of the exact amount of each FY allotment of funds as soon as such becomes known.

6.4.2 Schedule:

6.4.2.1 The SUBCONTRACTOR agrees to schedule and perform or have performed the contract work in such a manner as to ensure that, in the event of termination of this contract pursuant to Subcontract General Conditions, Clause, "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) would not exceed the total amount allotted at the time to the Subcontract. The CONTRACTOR shall not be obligated in any event to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this subcontract, anything to the contrary or any other provision of this Subcontract notwithstanding.

6.4.2.2 To insure compliance with the requirements of subparagraph 6.4.2.1 above, all schedules required elsewhere in this Subcontract shall relate to and describe the SUBCONTRACTOR'S proposed plan for performance of work and representation of work actually performed to the amount then allotted to this Subcontract. Furthermore, SUBCONTRACTOR shall schedule and relate planning for future performance of Work to the estimated allotments to this Subcontract referenced in subparagraph 6.4.1, above.

- 6.4.3 Notices – Actions When Costs Approach Total Amounts Allotted: Until such time as the CONTRACTOR has allotted funds up to the full Subcontract price, including any adjustments thereto, the SUBCONTRACTOR shall notify the CONTRACTOR in writing 30 days in advance of the point when, in the event of termination of this Subcontract pursuant to the article hereof entitled "Termination for Convenience", the total amount payable by the CONTRACTOR (including amounts payable in respect of subcontracts and settlement costs) will approximate eighty-five percent (85%) of the total amount then allotted to the Subcontract. Upon receipt of such notice, the CONTRACTOR may take one of, or a combination of, the following actions:

6.4.3.1 Instruct the SUBCONTRACTOR to continue performance of the Subcontract to the extent permitted by the amount of funds then allocated to this Subcontract;

6.4.3.2 Increase the amount of funds allotted to the Subcontract and instruct the SUBCONTRACTOR to proceed with work not previously funded;

6.4.3.3 Order the SUBCONTRACTOR to suspend all or any part of the work in accordance with Subcontract General Conditions, "Suspension". If the suspension of work has resulted from the failure of the SUBCONTRACTOR to schedule and perform the Subcontract work in accordance with the provisions of subparagraph 6.4.2 above, the SUBCONTRACTOR shall not be entitled to an equitable adjustment in Subcontract price nor time, nor shall the costs of the suspension be allowable in any subsequent

termination of the Subcontract for the convenience of the CONTRACTOR, irrespective of the provisions of the "Suspension" article, the "Termination for Convenience" article, or any other section or provision of the Subcontract; or

- 6.4.3.4 Terminate the performance of all or part of the work under this Subcontract in accordance with the "Termination for Convenience" section; or
- 6.4.3.5 Direct the SUBCONTRACTOR to take such action, as is agreed by the parties in writing to be appropriate under the circumstances (provided such action does not exceed the total funds then allotted).
- 6.4.4 SUBCONTRACTOR Excused From Further Performance: Before the allotment of funds up to the total Subcontract price (including any adjustments thereto), when the SUBCONTRACTOR'S performance has reached the point at which in the event of exercise of the "Termination" section of this Subcontract, the total amount payable by the CONTRACTOR would equal 100% (one hundred percent) of the amount then allotted to this Subcontract, the SUBCONTRACTOR shall immediately notify the CONTRACTOR and shall make no further commitments or expenditures (except to meet existing commitments and liabilities). The CONTRACTOR shall not be obligated to pay the SUBCONTRACTOR an amount in excess of the total amount then allotted to the Subcontract. If additional funds are not allotted by the date set forth in subparagraph 6.4.1 above, or such later date as may be agreed to by both parties, the SUBCONTRACTOR shall not be obligated to continue performance under this Subcontract and the CONTRACTOR will, upon written request of the SUBCONTRACTOR, terminate the Subcontract pursuant to the provisions of the "Termination for Convenience" article, provided, however that in no event shall the CONTRACTOR be obligated to pay or reimburse the SUBCONTRACTOR in excess of the amount then allotted to this Subcontract.
- 6.4.5 If the SUBCONTRACTOR incurs additional costs or is delayed in the performance of the work under this Subcontract solely by reason of the failure of the CONTRACTOR to allot additional funds in accordance with the subparagraph 6.4.1 above, and if additional funds are allotted, equitable adjustments shall be made in Subcontract price and performance time.
- 6.4.6 The CONTRACTOR may at any time prior to termination, and with the consent of the SUBCONTRACTOR after notice of termination, allot additional funds to this Subcontract.
- 6.4.7 Nothing in this clause shall affect the right of the CONTRACTOR to terminate this Subcontract pursuant to the article of this Subcontract entitled, "Termination for the Convenience of the Government".
- 6.4.8 Change Orders: Changes issued pursuant to Subcontract General Conditions, "Changes", shall not be considered authorization for the SUBCONTRACTOR to exceed the amount allotted to this Subcontract in the absence of a statement in the Change Order, or other written notice to the SUBCONTRACTOR, increasing the amount allotted to this Subcontract.

SC 6.5 TECHNICAL DIRECTION

- 6.5.1 The term "technical direction" is defined as: (1) directions to the SUBCONTRACTOR, which shift work emphasis between work areas, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to facilitate the Subcontract Scope of Work; (2) provision of written information to the Subcontract that assists in the interpretation of drawings, specifications or technical portions of the work description; and (3) review and approval of technical reports, drawings, specifications, and technical information to be delivered by the SUBCONTRACTOR to the CONTRACTOR under the subcontract.
- 6.5.2 Technical direction must be within the Scope of Work stated in the subcontract. Unless so delegated, CONTRACTOR'S Subcontract Technical Representative (STR) does not have the

authority to, and may not issue any direction which: (1) constitutes an assignment outside the Scope of Work; (2) constitutes a change as defined in the Subcontract Clause, "Changes"; (3) in any manner causes an increase or decrease in the total estimated subcontract cost, the fixed unit rates, if any, or the time required for subcontract performance; and (4) changes any of the expressed terms and conditions.

6.5.3 The SUBCONTRACTOR shall proceed promptly with the performance of technical direction issued by the CONTRACTOR'S STR in the manner prescribed by this article and within the authority under the provisions of this article. If, in the opinion of the SUBCONTRACTOR, any instruction or direction by the CONTRACTOR'S STR falls within one of the categories defined in subparagraph 6.5.2 above, the SUBCONTRACTOR shall not proceed, but shall notify the Subcontract Administrator in writing within ten (10) working days after receipt of any such instruction or direction and shall request the Subcontract Administrator to modify the Subcontract accordingly.

6.5.4 A failure of the SUBCONTRACTOR and Subcontract Administrator to agree that the technical direction is within the Statement of Work or a failure to agree upon the contract action to be taken with respect thereto shall be subject to the provisions of the clause entitled, "Disputes".

SC 6.6 TRAVEL AND BUSINESS EXPENSE (NON-REPRESENTED EMPLOYEES ONLY)

Business related travel for non-represented employees is not generally authorized. In the event travel is authorized, SUBCONTRACTOR shall comply with WCH procedures. All authorized travel will be reimbursed in accordance with the Federal Travel Regulations (FTRs). Additionally, the following clauses apply:

6.6.1 En Route Expenses:

6.6.1.1 Transportation via public carrier will be reimbursed up to the equivalent of least cost economy (refundable) air fare plus actual and reasonable expenses in traveling shortest and most direct route from traveler's home office, to Richland Washington or at other such locations and return, at request of CONTRACTOR. Meals and incidental expenses (M&IE) includes meals, laundry, tips and phone calls to reserve lodging accommodations. Reimbursement for local travel is not authorized.

6.6.1.2 Subcontractor shall be reimbursed for lodging, subsistence and miscellaneous expenses incurred by SUBCONTRACTOR when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR consistent with the limits as described in the Federal Travel Regulations (FTR) set forth in 41 Code of Federal Regulations (CFR), latest supplement. This bulletin specifies expense limits for all geographical areas of the United States.

6.6.2 Automobile Rental:

Car rental expenses incurred by the subcontractor when traveling or while at locations other than the traveler's home office at the request of the CONTRACTOR for actual and reasonable cost incurred, supported by receipts.

6.6.3 Personal Automobile:

Mileage costs via the most direct route will be reimbursed at the current Government travel regulation rate. No reimbursement will be provided for a second automobile. Total costs for this mode of transportation may not exceed the total allowances that would have been provided had the employee traveled by public air carrier (including expenses to/from the airport and the lodging and M&IE per diem. Reimbursement for receipted toll charges is allowed over and above the mileage and M&IE.

6.6.4 Lodging, Meals, and Incidental Expenses:

6.6.4.1 Reimbursement for Temporary Assignment lodging, meals, and incidental expenses will be in accordance with the Lodging Plus methodology for the first thirty (30) days of assignment or until long-term lodging is obtained, whichever occurs first. After long-term lodging is obtained, or the thirty (30) day period has elapsed, the per diem allowance for lodging and meals and incidental expenses will be no more than seventy-five percent (75%) of the approved rate otherwise applicable.

6.6.4.2 Rental of a standard single apartment in the area, after long term lodging is obtained, or the 30-day period has elapsed, rent will be expensed via a Travel Expense Report. Proof of lodging, via receipts/copy of a signed lease agreement is required.

6.6.4.3 Subcontractors on single status assignments of three months or more may be granted trips home with approval, not to exceed a frequency of once every six weeks provided that a minimum of 30 days remain in the assignment. All travel shall be approved by the WCH STR based upon current work load.

Trips normally will be scheduled for weekends and will be on Subcontractor's time. Transportation and subsistence for trips home will be reimbursed subject to FTRs. If a Subcontractor elects to drive home, the amount may not exceed what the Subcontractor would have incurred for economy class round-trip airfare transportation home. Per Diem for M&IE is not paid during the "at-home" portion of a home leave. Lodging costs are not reimbursed for either the "en route" or the "at home" portion of home leave, however, lodging costs at the work location during home leave will be reimbursed if monthly rates are applicable.

6.6.5 Interruption of Per Diem:

During the per diem period, the meals/incidentals portion is forfeited in the following circumstances:

- 6.6.5.1 When Personal Time Off is taken in excess of two consecutive work days for reasons other than illness;
- 6.6.5.2 When Personal Time Off is taken for more than two consecutive days in conjunction with a weekend (e.g., Thursday, Friday, Weekend, Monday).
- 6.6.5.3 Any vacation period(s) taken in conjunction with travel including weekends or holidays taken in conjunction with vacation, and the periods covering return trips to the place of abode, are not reimbursable.

6.6.6 Other Provisions:

- 6.6.6.1 Receipts shall be provided substantiating travel expenses, lodging, rental cars, etc. Receipts are not required for meals and incidental expenses. Reimbursement for M&IE will not be made in excess of the maximum allowable daily totals.
- 6.6.6.2 This allowance shall be reduced on the first and last day of travel in accordance with the FTRs as follows:

Travel Duration	M&IE Reimbursement
Day of Departure	75% of Applicable M&IE Rate
Full day(s) of Travel	100% of Applicable M&IE Rate
Last Day of Travel	75% of Applicable M&IE Rate

- 6.6.6.3 Subcontractors on business travel in support of this Subcontract shall only be paid Labor Hours for travel during regular work hours. Any travel time paid in excess of 8 hours shall be paid at the regular straight time rate.

SC 6.7 INTEGRATED WORK CONTROL PROGRAM

Integrated Work Control (IWC) utilizes multi-disciplinary teamwork and worker involvement to support the identification, analysis, and mitigation of work site hazards; development of work packages; performance of work; and use of the observational approach for newly identified hazards. [10 CFR 851.21, and 22]. The work packages for construction of Cells 9 & 10 will be prepared by the Construction Subcontractor and will be developed and approved for release utilizing a graded approach based on risk and complexity of the work hazards and worker competence. [10 CFR 851.22].

The SUBCONTRACTOR's work performed within the Construction Subcontractor's work area shall be performed in accordance with the Construction Subcontractor's Integrated Work Control Program. The Integrated Work Control Program requirements are specified in Exhibit K.

SC 6.8 SAFETY INCENTIVE

6.8.1 Incentive

In addition to the need to protect the health and safety of the subcontractor's worker, the ability to maintain a safe and incident free work site ensures numerous financial benefits including a more productive work force, better relationships with the workers, lower insurance costs for subcontractors working, and few reports of incidents. The precise value of the items resulting from an accident at the site cannot be readily quantified. Therefore, the CONTRACTOR has allocated a quarterly financial incentive that allows the SUBCONTRACTOR the opportunity to earn an amount equal to Four Hundred Dollars (\$400.00) per eligible employee (computed in accordance with paragraph 6.8.3). Payment of incentive to SUBCONTRACTOR or sub-tier subcontractor employee is based on achieving zero OSHA Recordable Cases and OSHA Lost Work Day Cases (Days Away from Work, or restricted Work Days, or both), for WCH Hanford Site Work performed by SUBCONTRACTOR and SUBCONTRACTOR's sub-tier subcontractors as defined in paragraph 6.8.2 below.

6.8.2 Eligible Employees

- 6.8.2.1 Eligible SUBCONTRACTOR Employees are defined as any category of employee who works a minimum of three hundred (300) hours in any quarter for the SUBCONTRACTOR on a WCH project at the Hanford Site.
- 6.8.2.2 Eligible Sub-tier Subcontractor Employees are defined as any category of sub-tier subcontractor employee performing a minimum of three hundred (300) hours of long term field work during any calendar quarter when work is performed on a WCH Hanford Site project. Long term field work is defined a sub-tier subcontract work with a period of continuous performance in excess of six (6) months during the subcontract period of performance. The SUBCONTRACTOR will flow down the safety incentive to eligible sub-tier subcontractor employees meeting the criteria above.

6.8.3 Safety Incentive Periods and Computation

- 6.8.3.1 Initial Incentive Period – The Incentive Period will begin on the first day of the next month following the issue of approval by the CONTRACTOR for the SUBCONTRACTOR to mobilize at the Hanford Site. The first incentive payment will be pro-rated to the end of the current calendar year quarter.

6.8.3.2 Subsequent Incentive Periods – Subsequent Incentive Periods will be on a calendar quarter basis (January – March, April – June, July – September, or October – December) and continue through the end of the subcontract term. For a subcontract ending in mid-quarter, the incentive will be pro-rated based on the number of weeks completed in that quarter.

The recordable and Lost Work Day criteria and corresponding percentage of Safety Incentive earned are specified in the following table:

**Safety Performance Incentive Fee Schedule
Quarterly Safety Goals**

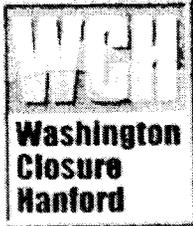
Safety Incident	One OSHA TRC recordable injury or illness (Medical Treatment or DART-Restricted Case)	Two OSHA TRC recordable injury or illnesses (Medical Treatment or DART-Restricted Case)	One OSHA recordable Lost Workday Case (Day Away DART-Day Away Case)	One or more OSHA TRC or DART Case(s) in each of two consecutive quarters
Reductions to Incentive Earned	Fifty percent (50%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive	One Hundred percent (100%) reduction in quarterly incentive

Note: Failure to report an injury or accident, or the intentional and unauthorized altering of the scene of an injury or accident will result in a one hundred percent (100%) reduction of the quarterly incentive fee for two consecutive quarters.

6.8.3.3 Safety Incentive Payment – The Safety Incentive will be paid quarterly on the basis of four hundred dollars (\$400) per eligible employee per quarter to include sub-tier subcontractors as outlined above. The SUBCONTRACTOR will supply to the CONTRACTOR a listing of employees eligible to receive the incentive on a quarterly basis, which will establish the total potential amount of the incentive, subject to reductions as listed above. Subsequent to the distribution of incentive to employees in each quarter, SUBCONTRACTOR will provide to CONTRACTOR confirmation that the listed eligible employees received incentive payouts. An eligible employee is defined as a SUBCONTRACTOR employee that has worked for the SUBCONTRACTOR on a WCH project for a minimum of three hundred (300) hours in the quarter (See 6.8.2).

6.8.3.4 At SUBCONTRACTOR's discretion, a portion of the Safety Incentive may be retained for safety-related lunches, prizes, gifts, etc. for the benefit of the work force; however, it is expected that at least ninety percent (90%) will be passed along to SUBCONTRACTOR employees in the form of an equally distributed cash payout.

6.8.3.5 Where the SUBCONTRACTOR has an eligible sub-tier subcontractor, the total sub-tier subcontractor incentive amount will be based on four hundred dollars (\$400) per employee per quarter (see 6.8.2.2), minus any deductions outlined in the Safety Performance Incentive Fee Schedule. The SUBCONTRACTOR will inform the sub-tier subcontractor of the expectation to pass along at least ninety percent (90%) of the incentive to its employees in the form of equally distributed cash payouts.



149043

March 3, 2010

Mr. Joe Voss, Project Manager
Envirotech Engineering and Consulting, Inc.
2620 Fermi Ave. MSIN: T2-11
Richland, WA 99354

Subject: Subcontract No. S013213A00
**CHANGE NOTICE CN-001, ADDITION TO EXHIBIT G, REV. 0 TO
INCLUDE DOE-0343, "STOP WORK" PROCEDURE
(FUNDED BY THE AMERICAN RECOVERY AND REINVESTMENT ACT)**

Dear Mr. Voss:

Attached please find Change Notice CN-001, *Addition to Subcontract Exhibit G, Rev. 0, to Include DOE-0343, "Stop Work" Procedure*. This work is funded by the American Recovery and Reinvestment Act of 2009 (ARRA).

If you have any questions regarding this change notice, please contact me at (509) 373-9476, or (509) 942-9275, or via email (the preferred method).

Sincerely,

A handwritten signature in black ink, appearing to read 'Charles V. Skiba'.

Charles V. Skiba
Subcontract Technical Representative

CVS:djt

Attachments: (A) Change Notice CN-001



SUBCONTRACT CHANGE NOTICE

WCH Customer: DOE-RL	Job No.: 14655
Subcontractor: Envirotech Engineers & Consultants, Inc.	Letter No.:
Address: 2620 Fermi Ave. MSIN T2-11 Richland, WA 99354 Attn: Mr. Joe Voss, Project Manager	Effective Date: 02/17/10
	Subcontract No.: S013213A00
	Change Notice No.: 001
Page 1 of 1	

This Change Notice is forwarded for your signature. Please complete this form as required and return the original to the responsible STR. A copy has been included for your files.

Description of Change:

ADDITION TO SUBCONTRACT EXHIBIT G, Rev. 14, - INCLUSION OF DOE 0343, SITE STOP WORK PROCEDURE THIS CN IS FUNDED BY THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009 (ARRA).

Add new clause:

4.1.02.G.16 All stop work actions will be executed in accordance with the most current version of DOE -0343 "Stop Work." Which can be found at the following web address:

http://www.hanford.gov/files.cfm/Hanford_Stop_Work_Procedure.pdf

Ensure that all personnel are briefed to the procedure and that this briefing is documented.

- | | |
|---|---|
| <input checked="" type="checkbox"/> Proceed with work | <input type="checkbox"/> Notice to proceed required |
| <input checked="" type="checkbox"/> No change in price authorized | <input checked="" type="checkbox"/> No extension of time authorized |
| <input checked="" type="checkbox"/> Proposal not required | <input type="checkbox"/> Submit proposal within _____ days |
| <input type="checkbox"/> Drawings/Data attached | <input type="checkbox"/> |

Project Manager/CAM:

W.F. Melvin		03/02/10
Print Name	Signature	Date

STR:

Charles V. Skiba		03/02/10
Print Name	Signature	Date

Procurement:

Dana D. Looney		3-3-10
Print Name	Signature	Date

Initial: N/A N/A N/A N/A N/A

Safety QA Eng. Env. RadCon

Acknowledge and accept this change notice as specified.

Acknowledge and accept with the exception of the following:

- | | | |
|---|-------------|--|
| <input type="checkbox"/> ARE proceeding with this change notice | A proposal: | <input type="checkbox"/> Has been submitted |
| <input type="checkbox"/> ARE NOT proceeding with this change notice | | <input type="checkbox"/> Will be submitted within _____ days |
| | | <input type="checkbox"/> Will not be submitted |

Signature:	Company: Envirotech Engineers and Consultants	Date:
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Stop Work

DOE-0343

Revision 2

Effective Date: January 18, 2010

Stop Work

1.0 PURPOSE

The purpose of this procedure is to ensure that all employees are given the responsibility and authority to stop work when employees believe that a situation exists that places them, their coworker(s), contracted personnel, or the public at risk or in danger; could adversely affect the safe operation or cause damage to the facility; or result in a release of radiological or chemical effluents to the environment above regulatory requirements or approvals; and provides a method to resolve the issue (see Appendix A). Maintaining a diligent questioning attitude is vital to safe execution of work-scope and is a cornerstone to effective Conduct of Operations and Integrated Safety Management.

Portions of this procedure implement requirements of the Worker Safety and Health Program Plan for compliance to 10 *Code of Federal Regulations* (CFR) 851, “Worker Safety and Health Program” and are bracketed in the text. This procedure also implements the “Stop Work and Shutdown Authorization” clause included in section H of each of DOE’s Prime Contracts (see Appendix B).

This procedure extends the authority to stop work to situations where an employee believes there is a need to clarify work instructions; or to propose additional controls.

2.0 SCOPE

This procedure is applicable to all contractors and subcontract personnel working at the Hanford site.

3.0 RESPONSIBILITIES

3.1 Employees

In supporting safe execution of work, all personnel, have the following responsibilities [10 CFR 851.A1]:

- The responsibility and authority to stop work or decline to perform an assigned task without fear of reprisal, to discuss and resolve work and safety concerns. The Stop Work may include discussions with co-workers, supervision, or safety representative to resolve work related issues, address potential unsafe conditions, clarify work instructions, propose additional controls, etc.
- The responsibility and authority to initiate a Stop Work IMMEDIATELY, without fear of reprisal, when the employee believes a situation exists which places himself/herself, a coworker(s), or the environment in danger or at risk.
- The responsibility to report any activity or condition the employee believes is unsafe or for which they have initiated a Stop Work. Notification should be made to the affected worker(s) and to the supervisor or their supervisor’s designee at the location where the activity or condition exists.

Stop Work

- The responsibility to notify their supervisor if a raised Stop Work issue has not been resolved to their satisfaction through established channels prior to the resumption of work. Alternatively, contact the employer's Employee Concerns Program or the DOE Employee Concerns Program.
- Employee can contact their safety representative or union safety representative with a concern or to initiate a stop work, if the employee prefers to remain anonymous.

3.2 Management/Supervisor/Person in Charge (PIC)/ Field Work Supervisor (FWS)

Management and supervision are committed to promptly resolve issues resulting from an employee-raised Stop Work [10 CFR 851.20]. Management (e.g., Directors, Managers, Supervisors) responsibilities are to:

- Resolve any issues that have resulted in an individual stopping a specific task(s) or activity.
- Provide feedback to individual/s and the affected work group who have exercised their Stop Work responsibility on the resolution of their concern prior to resuming work. If the employee that issued a stop work is not available due to reasons such as vacation, PTB, PTO, shift change, or training then the supervisor provides the feedback to the safety representative and union safety representative, prior to resuming work.
- Notify the employer's Safety Representative and the Union Safety Representative, when bargaining unit personnel are affected, if a raised stop work issue has not been resolved.
- Notify the DOE Facility Representative if the Contractor's Stop Work action meets the Stop Work Criteria defined in Appendix B.
- Ensure no actions are taken as reprisal or retribution against individuals who raise safety concerns or stop an activity they believe is unsafe.
- If a stop work is not brought up by a bargaining unit employee, but does impact bargaining unit personnel, then also notify the union safety representative.

3.3 Safety Representatives(s) and Union Safety Representative(s) are Responsible to:

- Assist employees, supervision and management in the resolution of safety issues and concerns.
- Immediately contact management and work to resolve issues when an employee has called a situation to their attention that has not been resolved.
- Discuss resolution with employees involved in a work stoppage where resolution was completed after their shift or when they were unavailable, or where he/she acted as their representative in reaching resolution.
- Work as the agent of an employee that prefers to remain anonymous to work directly in the resolution of the stop work.

Stop Work

4.0 IMPLEMENTATION

Effective Immediately.

5.0 PROCESS

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Employee	1.	Stop work if an activity or condition is believed to be unsafe, such as: <ol style="list-style-type: none">A situation exists that places them, their coworker(s), contracted personnel, or the public at risk or in danger;A situation could adversely affect the safe operation or cause damage to the facility; orA situation could result in a release of radiological or chemical effluents to the environment above regulatory requirements or approvals.To clarify work instructions or to propose additional controls
Manager/ Supervisor/PIC/ FWS	2.	Ensure the work/activity is in, or placed in a safe condition and <u>immediately</u> notify supervision/management and affected workers when you stop work or decline to perform an activity.
	3.	Resolve any issues that have resulted in an employee stopping work or an activity. <p>Involve individuals who initiated the Stop Work or their appropriate safety representatives if the individual is not available, in reaching mutual agreement on the resolution or proposed actions necessary to return to work.</p> <p>Be sure any necessary corrective or compensatory actions are taken before resuming an activity and are documented* in accordance with Contractor procedures (logbook or other established method of reporting/tracking/communicating safety issues and corrective action management).</p> <p>Notify senior management, and the DOE Facility Representative if the Stop Work meets the Stop Work Criteria defined in Contract Section H "Stop-Work and Shutdown Authorization" (Appendix B), Report in accordance with established notification processes (e.g., occurrence reporting).</p>

Stop Work

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
	4.	<p>If a Stop Work has not been resolved to the mutual agreement of manager and employee, then the stop work remains in place and the Supervisor/PIC/FWS will notify the appropriate company management, safety representative and union safety representative. Resolution of the stop work resides with the union safety representative and company management to resolve and/or propose actions necessary to return to work. Work may be resumed when union safety representation and management agree that the issue has been resolved. The objective is to reach resolution at the lowest levels of engagement.</p> <p>Notify the DOE Facility Representative that a Stop Work has resulted in an unresolved issue.</p> <p>*NOTE: For resumption of radiological work, consult the Radiological Control Manual for additional approval requirement.</p>

5.0 REFERENCES

- Hanford Site Stop Work Policy
- 10 CFR 830, "Nuclear Safety Management," *Code of Federal Regulations*
- 10 CFR 851, "Worker Safety and Health Program," *Code of Federal Regulations*
- 10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations**
- DOE-STD-1098-2008, Department of Energy (DOE) Radiological Control Standard

Stop Work

Appendix A Stop Work Policy

Stop Work Responsibility: Every Hanford site employee, regardless of employer, has the responsibility and authority to stop work IMMEDIATELY, without fear of reprisal, when the employee believes:

1. Conditions exist that pose a danger to the health and safety of workers or the public; or
2. Conditions exist, that if allowed to continue, could adversely affect the safe operation of, or could cause serious damage to, a facility; or
3. Conditions exist, that if allowed to continue, could result in the release from the facility to the environment of radiological or chemical effluents that exceed applicable regulatory requirements or approvals.

Reporting Unsafe Conditions: Employees are expected to report any activity or condition which he/she believes is unsafe. Notification should be made to the affected worker(s) and then to the supervisor or designee at the location where the activity or condition exists. Following notification, resolution of the issue resides with the responsible supervisor.

Right to a Safe Workplace: Any employee who reasonably believes that an activity or condition is unsafe is expected to stop or refuse work without fear of reprisal by management or coworkers and is entitled to have the safety concern addressed prior to participating in the work.

Stop Work Resolution: If you have a "stop work" issue that has not been resolved through established channels, immediately contact your employer's Safety Representative or your Union Safety Representative. Alternatively, you may contact the employer's Employee Concerns Program or the DOE Employee Concerns Program.

Stop Work

Appendix B DOE Facility Representative (FR) Notification Requirements

If any of the following criteria is met or notification of facility management is required for the issue, the Supervisor/Manager will notify the FR on a 24 hour real time basis.

Stop Work Criteria:

1. Conditions exist that pose an imminent danger to the health and safety of workers or the public; or
2. Conditions exist, that if allowed to continue, could adversely affect the safe operation of, or could cause serious damage to, the facility; or
3. Conditions exist, that if allowed to continue, could result in the release from the facility to the environment of radiological or chemical effluents that exceed applicable regulatory requirements or approvals.

The following definitions shall be used in conjunction with the above stated criteria:

Imminent Danger: Any condition or practice such that a hazard exists that could reasonably be expected to cause death, serious physical harm, or other serious hazard to employees, unless immediate actions are taken to mitigate the effects of the hazard and/or remove employees from the hazard.

Adversely Affects Safe Operation of Facility or Serious Facility Damage: A condition, situation, or activity that if not terminated or mitigated could reasonably be expected to result in: nuclear criticality; facility fire/explosion; major facility or equipment damage or loss; or, a facility evacuation response.