

ENGINEERING CHANGE NOTICE			Page 1 of <u>2</u>	1. ECN <u>159359</u>																																								
2. ECN Category (mark one) Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Supersedeure <input type="checkbox"/> Discovery <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. <u>W. W. PICKETT, KEH, E6-50, 6-1828</u>		4. Date <u>7/14/92</u>																																									
5. Project Title/No./Work Order No. <u>W-011H, WSCF/CR9497</u>		6. Bldg./Sys./Fac. No. <u>6266</u>	7. Impact Level <u>3Q</u> <u>3/SC-3</u>																																									
8. Document Number Affected (include rev. and sheet no.) <u>SPEC W-011H-C1, Rev-1</u>		9. Related ECN No(s). <u>N/A</u>	10. Related PO No. <u>N/A</u>																																									
11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input type="checkbox"/> No (NA Blks. 11b, 11c, 11d) <u>UNKNOWN</u>	11b. Work Package Doc. No. <u>UNKNOWN</u>	11c. Complete Installation Work <u>N/A</u> Cog. Engineer Signature & Date	11d. Complete Restoration (Temp. ECN only) <u>N/A</u> Cog. Engineer Signature & Date																																									
12. Description of Change <div style="float: right; border: 1px solid black; padding: 2px; margin-top: 10px;">SC-3</div> <p style="font-size: 1.2em; margin-top: 20px;">SPEC W-011H-C1, Rev. 1</p> <p style="margin-top: 10px;">SECTION 02745, Paragraph 2.2.4.1</p> <p style="margin-top: 10px;">Revise pump horse power From 5 To 4 hp.</p>																																												
13a. Justification (mark one) Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found <input type="checkbox"/> Facilitate Const. <input checked="" type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission <input type="checkbox"/>	13b. Justification Details <p style="font-size: 1.1em;">Substitution by contractor of a sewage pump of 4hp meeting performance requirements of 325 gpm at 31 feet of head.</p>																																											
14. Distribution (include name, MSIN, and no. of copies) <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="border-bottom: 1px solid black;"><u>KEH DISTRIBUTION</u></td> <td style="border-bottom: 1px solid black;">E2-50</td> <td style="border-bottom: 1px solid black;">A. V. Lincoln</td> <td style="border-bottom: 1px solid black;">S2-62</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>Const Doc Cntl</u></td> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;">P. J. McKenna</td> <td style="border-bottom: 1px solid black;">R3-54</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>WHC DISTRIBUTION</u></td> <td style="border-bottom: 1px solid black;"></td> <td style="border-bottom: 1px solid black;">C. B. McVey</td> <td style="border-bottom: 1px solid black;">H1-61</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>Central Files</u></td> <td style="border-bottom: 1px solid black;">L8-04</td> <td style="border-bottom: 1px solid black;">T. G. Montgomery</td> <td style="border-bottom: 1px solid black;">T6-12</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>Project Files</u></td> <td style="border-bottom: 1px solid black;">R1-28</td> <td style="border-bottom: 1px solid black;">C. E. Norton</td> <td style="border-bottom: 1px solid black;">S1-54</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>D. A. Conners, IV</u></td> <td style="border-bottom: 1px solid black;">T6-10</td> <td style="border-bottom: 1px solid black;">M. C. Prather</td> <td style="border-bottom: 1px solid black;">L5-07</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>L. L. Curfman [2]</u></td> <td style="border-bottom: 1px solid black;">T6-12</td> <td style="border-bottom: 1px solid black;">E. A. Smith</td> <td style="border-bottom: 1px solid black;">L5-07</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>J. J. Dorian</u></td> <td style="border-bottom: 1px solid black;">B2-16</td> <td style="border-bottom: 1px solid black;">T. L. Sweet</td> <td style="border-bottom: 1px solid black;">S4-01</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>J. K. Epperley</u></td> <td style="border-bottom: 1px solid black;">R1-29</td> <td style="border-bottom: 1px solid black;">J. E. Witherspoon (PE) [2]</td> <td style="border-bottom: 1px solid black;">R3-35</td> </tr> <tr> <td style="border-bottom: 1px solid black;"><u>S. S. Glover</u></td> <td style="border-bottom: 1px solid black;">R3-54</td> <td style="border-bottom: 1px solid black;">DOE: M. S. Collins</td> <td style="border-bottom: 1px solid black;">A5-18</td> </tr> </table>			<u>KEH DISTRIBUTION</u>	E2-50	A. V. Lincoln	S2-62	<u>Const Doc Cntl</u>		P. J. McKenna	R3-54	<u>WHC DISTRIBUTION</u>		C. B. McVey	H1-61	<u>Central Files</u>	L8-04	T. G. Montgomery	T6-12	<u>Project Files</u>	R1-28	C. E. Norton	S1-54	<u>D. A. Conners, IV</u>	T6-10	M. C. Prather	L5-07	<u>L. L. Curfman [2]</u>	T6-12	E. A. Smith	L5-07	<u>J. J. Dorian</u>	B2-16	T. L. Sweet	S4-01	<u>J. K. Epperley</u>	R1-29	J. E. Witherspoon (PE) [2]	R3-35	<u>S. S. Glover</u>	R3-54	DOE: M. S. Collins	A5-18	RELEASE STAMP <div style="border: 1px solid black; padding: 10px; margin-top: 10px; text-align: center;"> OFFICIAL RELEASE BY WHC 13 DATE JUL 15 1992 STA 4 </div>	
<u>KEH DISTRIBUTION</u>	E2-50	A. V. Lincoln	S2-62																																									
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STA 10
STA 6

A3-87
T2-03

ENGINEERING CHANGE NOTICE

Page 2 of 2

1. ECN (use no. from pg. 1)

W-0114-61

15. Design Verification Required

- Yes
 No

16. Cost Impact

ENGINEERING

Additional \$ 200
Savings \$ _____

CONSTRUCTION

Additional \$ 0
Savings \$ _____

17. Schedule Impact (days)

Improvement 0
Delay _____

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD <input type="checkbox"/> Functional Design Criteria <input type="checkbox"/> Operating Specification <input type="checkbox"/> Criticality Specification <input type="checkbox"/> Conceptual Design Report <input type="checkbox"/> Equipment Spec. <input type="checkbox"/> Const. Spec. <input type="checkbox"/> Procurement Spec. <input type="checkbox"/> Vendor Information <input type="checkbox"/> OM Manual <input type="checkbox"/> FSAR/SAR <input type="checkbox"/> Safety Equipment List <input type="checkbox"/> Radiation Work Permit <input type="checkbox"/> Environmental Impact Statement <input type="checkbox"/> Environmental Report <input type="checkbox"/> Environmental Permit <input type="checkbox"/>	Seismic/Stress Analysis <input type="checkbox"/> Stress/Design Report <input type="checkbox"/> Interface Control Drawing <input type="checkbox"/> Calibration Procedure <input type="checkbox"/> Installation Procedure <input type="checkbox"/> Maintenance Procedure <input type="checkbox"/> Engineering Procedure <input type="checkbox"/> Operating Instruction <input type="checkbox"/> Operating Procedure <input type="checkbox"/> Operational Safety Requirement <input type="checkbox"/> IEFD Drawing <input type="checkbox"/> Cell Arrangement Drawing <input type="checkbox"/> Essential Material Specification <input type="checkbox"/> Fac. Proc. Samp. Schedule <input type="checkbox"/> Inspection Plan <input type="checkbox"/> Inventory Adjustment Request <input type="checkbox"/>	Tank Calibration Manual <input type="checkbox"/> Health Physics Procedure <input type="checkbox"/> Spares Multiple Unit Listing <input type="checkbox"/> Test Procedures/Specification <input type="checkbox"/> Component Index <input type="checkbox"/> ASME Coded Item <input type="checkbox"/> Human Factor Consideration <input type="checkbox"/> Computer Software <input type="checkbox"/> Electric Circuit Schedule <input type="checkbox"/> ICRS Procedure <input type="checkbox"/> Process Control Manual/Plan <input type="checkbox"/> Process Flow Chart <input type="checkbox"/> Purchase Requisition <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/>
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19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
_____	_____	_____
_____	_____	_____
_____	_____	_____

20. Approvals

	Signature	Date		Signature	Date
<u>OPERATIONS AND ENGINEERING</u>			<u>ARCHITECT-ENGINEER</u>		
Cog./Project Engineer	<u>[Signature]</u>	<u>7/15/92</u>	PE	<u>[Signature]</u>	<u>7/14/92</u>
Cog./Project Engr. Mgr.	<u>[Signature]</u>	<u>7/15/92</u>	QA	<u>[Signature]</u>	<u>7/14/92</u>
QA	<u>[Signature]</u>	<u>7-15-92</u>	Safety	<u>[Signature]</u>	<u>7-14-92</u>
Safety	_____	_____	Design	<u>[Signature]</u>	<u>7/14/92</u>
Security	_____	_____	Other	<u>[Signature]</u>	<u>7/19/92</u>
Proj. Prog./Dept. Mgr.	_____	_____	ENV	<u>[Signature]</u>	<u>7/14/92</u>
Def. React. Div.	_____	_____	_____	_____	_____
Chem. Proc. Div.	_____	_____	_____	_____	_____
Def. Wst. Mgmt. Div.	_____	_____	<u>DEPARTMENT OF ENERGY</u>		
Adv. React. Dev. Div.	_____	_____	_____	_____	_____
Proj. Dept.	_____	_____	<u>ADDITIONAL</u>		
Environ. Div.	_____	_____	_____	_____	_____
IRM Dept.	_____	_____	_____	_____	_____
Facility Rep. (Ops)	_____	_____	_____	_____	_____
Other	_____	_____	_____	_____	_____

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 172015
 Proj. ECN W-01-52

2. ECN Category (mark one)
- Supplemental
 - Direct Revision
 - Change ECN
 - Temporary
 - Supersedure
 - Discovery
 - Cancel/Void

3. Originator's Name, Organization, MSIN, and Telephone No.
K. Hawk KEH-CM E2-30 372-1990

4. Date
6-1-92

5. Project Title/No./Work Order No. WSCF SIKWORK (W-01H)
 6. Bldg./Sys./Fac. No. 6266

7. Impact Level 3Q
Safety class 3

8. Document Number Affected (include rev. and sheet no.)
W-01-H-01 Rev. 1

9. Related ECN No(s) NA
 10. Related PO No. NA

- 11a. Modification Work
- Yes (fill out Blk. 11b)
 - No (NA Blks. 11b, 11c, 11d)
- Unknown

11b. Work Package Doc. No.
Unknown

11c. Complete Installation Work
 Cog. Engineer Signature & Date

11d. Complete Restoration (Temp. ECN only)
 Cog. Engineer Signature & Date

12. Description of Change

1. Spec. Section 16300, Paragraph 3.3.22, b Cable. SC3
~~Revise paragraph to read; "55KV shielded cable tested at 55KV dc for 5 minutes."~~ *col Huter*

2. Spec. Section 16400, Paragraph 2.2.2 j.
 Revise paragraph to read; "... red beacon light (approximately 0'-6" above panel)..."

- 13a. Justification (mark one)
- Criteria Change
 - Design Improvement
 - Environmental
 - As-Found *11/92*
 - Facilitate Const.
 - Const. Error/Omission *(2)*
 - Design Error/Omission

13b. Justification Details

~~1) Operator contractor (WKC) operating ^{col} ~~procedures only requires a 5 minute test.~~~~

2) we find the location as constructed acceptable.

14. Distribution (include name, MSIN, and no. of copies)

KEH DISTRIBUTION		
Const Doc Cnt1	E2-50	A. V. Lincoln S2-62
WHC DISTRIBUTION		
Central Files	L8-04	P. J. McKenna R3-54
Project Files	R1-28	C. B. McVey H1-61
D. A. Conners, IV	T6-10	T. G. Montgomery T6-12
L. L. Curfman [2]	T6-12	M. C. Prather L5-07
J. J. Dorian	B2-16	F. W. Ringe S1-54
J. K. Epperley	R1-29	E. A. Smith L5-07
		T. L. Sweet S4-01

RELEASE STAMP

OFFICIAL RELEASE 17

BY WHC

DATE JUN 15 1992

STA. 4

ENGINEERING CHANGE NOTICE

Page 2 of 2

1. ECN (use no. from pg. 1)

W-011-52

15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact <table style="width: 100%;"> <tr> <td style="width: 50%; text-align: center;">ENGINEERING</td> <td style="width: 50%; text-align: center;">CONSTRUCTION</td> </tr> <tr> <td>Additional <input checked="" type="checkbox"/> \$ <u>200⁰⁰</u></td> <td>Additional <input type="checkbox"/> \$ <u>0</u></td> </tr> <tr> <td>Savings <input type="checkbox"/> \$ _____</td> <td>Savings <input type="checkbox"/> \$ _____</td> </tr> </table>	ENGINEERING	CONSTRUCTION	Additional <input checked="" type="checkbox"/> \$ <u>200⁰⁰</u>	Additional <input type="checkbox"/> \$ <u>0</u>	Savings <input type="checkbox"/> \$ _____	Savings <input type="checkbox"/> \$ _____	17. Schedule Impact (days) Improvement <input type="checkbox"/> <u>0</u> Delay <input type="checkbox"/> _____
ENGINEERING	CONSTRUCTION							
Additional <input checked="" type="checkbox"/> \$ <u>200⁰⁰</u>	Additional <input type="checkbox"/> \$ <u>0</u>							
Savings <input type="checkbox"/> \$ _____	Savings <input type="checkbox"/> \$ _____							

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

<input type="checkbox"/> SDD/DD	<input type="checkbox"/> Seismic/Stress Analysis	<input type="checkbox"/> Tank Calibration Manual
<input type="checkbox"/> Functional Design Criteria	<input type="checkbox"/> Stress/Design Report	<input type="checkbox"/> Health Physics Procedure
<input type="checkbox"/> Operating Specification	<input type="checkbox"/> Interface Control Drawing	<input type="checkbox"/> Spares Multiple Unit Listing
<input type="checkbox"/> Criticality Specification	<input type="checkbox"/> Calibration Procedure	<input type="checkbox"/> Test Procedures/Specification
<input type="checkbox"/> Conceptual Design Report	<input type="checkbox"/> Installation Procedure	<input type="checkbox"/> Component Index
<input type="checkbox"/> Equipment Spec.	<input type="checkbox"/> Maintenance Procedure	<input type="checkbox"/> ASME Coded Item
<input type="checkbox"/> Const. Spec.	<input type="checkbox"/> Engineering Procedure	<input type="checkbox"/> Human Factor Consideration
<input type="checkbox"/> Procurement Spec.	<input type="checkbox"/> Operating Instruction	<input type="checkbox"/> Computer Software
<input type="checkbox"/> Vendor Information	<input type="checkbox"/> Operating Procedure	<input type="checkbox"/> Electric Circuit Schedule
<input type="checkbox"/> OM Manual	<input type="checkbox"/> Operational Safety Requirement	<input type="checkbox"/> ICRS Procedure
<input type="checkbox"/> FSAR/SAR	<input type="checkbox"/> IEFD Drawing	<input type="checkbox"/> Process Control Manual/Plan
<input type="checkbox"/> Safety Equipment List	<input type="checkbox"/> Cell Arrangement Drawing	<input type="checkbox"/> Process Flow Chart
<input type="checkbox"/> Radiation Work Permit	<input type="checkbox"/> Essential Material Specification	<input type="checkbox"/> Purchase Requisition
<input type="checkbox"/> Environmental Impact Statement	<input type="checkbox"/> Fac. Proc. Samp. Schedule	_____ <input type="checkbox"/>
<input type="checkbox"/> Environmental Report	<input type="checkbox"/> Inspection Plan	_____ <input type="checkbox"/>
<input type="checkbox"/> Environmental Permit	<input type="checkbox"/> Inventory Adjustment Request	_____ <input type="checkbox"/>

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
_____	_____	_____
_____	_____	_____
_____	_____	_____

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog./Project Engineer <u>[Signature]</u>	<u>6/15/92</u>	PE <u>[Signature]</u>	<u>6/11/92</u>
Cog./Project Engr. Mgr. <u>[Signature]</u>	<u>6/15/92</u>	QA <u>[Signature]</u>	<u>6/9/92</u>
QA <u>[Signature]</u>	<u>6-15-92</u>	Safety <u>[Signature]</u>	<u>6-10-92</u>
Safety _____	_____	Design <u>[Signature]</u>	<u>6/15/92</u>
Security _____	_____	Other <u>[Signature]</u>	<u>6/15/92</u>
Proj. Prog./Dept. Mgr. _____	_____	PE <u>[Signature]</u>	<u>6/15/92</u>
Def. React. Div. _____	_____	_____	_____
Chem. Proc. Div. _____	_____	_____	_____
Def. Wst. Mgmt. Div. _____	_____	_____	_____
Adv. React. Dev. Div. _____	_____	_____	_____
Proj. Dept. _____	_____	_____	_____
Environ. Div. _____	_____	_____	_____
IRM Dept. _____	_____	_____	_____
Facility Rep. (Ops) _____	_____	_____	_____
Other _____	_____	_____	_____

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN ~~172011~~

Proj. ECN W-01151

2. ECN Category (mark one) Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Supersedure <input type="checkbox"/> Discovery <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. <u>K. HAWK KEH-CM E2-30372-1990</u>		4. Date <u>6-1-92</u>
	5. Project Title/No./Work Order No. <u>WSCE SITE WORK (W-011A)</u>	6. Bldg./Sys./Fac. No. <u>6266</u>	7. Impact Level <u>3QS</u> <u>SAFETY CLASS 3</u>
	8. Document Number Affected (include rev. and sheet no.) <u>W-011-A-C1 REV 1</u>	9. Related ECN No(s). <u>NA</u>	10. Related PO No. <u>NA</u>

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input type="checkbox"/> No (NA Blks. 11b, 11c, 11d) <u>UNKNOWN</u>	11b. Work Package Doc. No. <u>UNKNOWN</u>	11c. Complete Installation Work _____ Cog. Engineer Signature & Date	11d. Complete Restoration (Temp. ECN only) _____ Cog. Engineer Signature & Date
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12. Description of Change 5C3

Spec. Section 02650, Paragraph 3.1.11.3

Revise PARAGRAPH to read; "After painting is complete, place 3 inch wide reflective bands around fire hydrant barricade posts as shown on the drawings."

13a. Justification (mark one) Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found <input type="checkbox"/> Facilitate Const. <input type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission <input checked="" type="checkbox"/>	13b. Justification Details <u>Body of Hydrant is not suitable to receive 6" Band of reflective bands. Bands of barricade posts is sufficient for reflection.</u>
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14. Distribution (include name, MSIN, and no. of copies)

<u>KEH DISTRIBUTION</u>	A. V. Lincoln	S2-62
Const Doc Cntl	P. J. McKenna	R3-54
<u>WHC DISTRIBUTION</u>	C. B. McVey	H1-61
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D. A. Conners, IV	F. W. Ringe	S1-54
L. L. Curfman [2]	E. A. Smith	L5-07
J. J. Dorian	T. L. Sweet	S4-01
J. K. Epperley	J. E. Witherspoon(PE)[2]	R3-35

RELEASE STAMP

OFFICIAL RELEASE 17

BY WHC

DATE JUN 10 1992

STA. 4

ENGINEERING CHANGE NOTICE

Page 2 of 2

1. ECN (use no. from pg. 1)

W-011-51

<p>15. Design Verification Required</p> <p><input type="checkbox"/> Yes</p> <p><input checked="" type="checkbox"/> No</p>	<p>16. Cost Impact</p> <table style="width: 100%;"> <tr> <td style="width: 50%;"> <p style="text-align: center;">ENGINEERING</p> <p>Additional: <input checked="" type="checkbox"/> \$ <u>200⁰⁰</u></p> <p>Savings: <input type="checkbox"/> \$ _____</p> </td> <td style="width: 50%;"> <p style="text-align: center;">CONSTRUCTION</p> <p>Additional: <input type="checkbox"/> \$ <u>0</u></p> <p>Savings: <input type="checkbox"/> \$ _____</p> </td> </tr> </table>	<p style="text-align: center;">ENGINEERING</p> <p>Additional: <input checked="" type="checkbox"/> \$ <u>200⁰⁰</u></p> <p>Savings: <input type="checkbox"/> \$ _____</p>	<p style="text-align: center;">CONSTRUCTION</p> <p>Additional: <input type="checkbox"/> \$ <u>0</u></p> <p>Savings: <input type="checkbox"/> \$ _____</p>	<p>17. Schedule Impact (days)</p> <p>Improvement: <input type="checkbox"/> <u>0</u></p> <p>Delay: <input type="checkbox"/> _____</p>
<p style="text-align: center;">ENGINEERING</p> <p>Additional: <input checked="" type="checkbox"/> \$ <u>200⁰⁰</u></p> <p>Savings: <input type="checkbox"/> \$ _____</p>	<p style="text-align: center;">CONSTRUCTION</p> <p>Additional: <input type="checkbox"/> \$ <u>0</u></p> <p>Savings: <input type="checkbox"/> \$ _____</p>			

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<input type="checkbox"/> Operating Specification	<input type="checkbox"/> Interface Control Drawing	<input type="checkbox"/> Spares Multiple Unit Listing	<input type="checkbox"/>
<input type="checkbox"/> Criticality Specification	<input type="checkbox"/> Calibration Procedure	<input type="checkbox"/> Test Procedures/Specification	<input type="checkbox"/>
<input type="checkbox"/> Conceptual Design Report	<input type="checkbox"/> Installation Procedure	<input type="checkbox"/> Component Index	<input type="checkbox"/>
<input type="checkbox"/> Equipment Spec.	<input type="checkbox"/> Maintenance Procedure	<input type="checkbox"/> ASME Coded Item	<input type="checkbox"/>
<input type="checkbox"/> Const. Spec.	<input type="checkbox"/> Engineering Procedure	<input type="checkbox"/> Human Factor Consideration	<input type="checkbox"/>
<input type="checkbox"/> Procurement Spec.	<input type="checkbox"/> Operating Instruction	<input type="checkbox"/> Computer Software	<input type="checkbox"/>
<input type="checkbox"/> Vendor Information	<input type="checkbox"/> Operating Procedure	<input type="checkbox"/> Electric Circuit Schedule	<input type="checkbox"/>
<input type="checkbox"/> OM Manual	<input type="checkbox"/> Operational Safety Requirement	<input type="checkbox"/> ICRS Procedure	<input type="checkbox"/>
<input type="checkbox"/> FSAR/SAR	<input type="checkbox"/> IEPD Drawing	<input type="checkbox"/> Process Control Manual/Plan	<input type="checkbox"/>
<input type="checkbox"/> Safety Equipment List	<input type="checkbox"/> Cell Arrangement Drawing	<input type="checkbox"/> Process Flow Chart	<input type="checkbox"/>
<input type="checkbox"/> Radiation Work Permit	<input type="checkbox"/> Essential Material Specification	<input type="checkbox"/> Purchase Requisition	<input type="checkbox"/>
<input type="checkbox"/> Environmental Impact Statement	<input type="checkbox"/> Fac. Proc. Samp. Schedule	_____	<input type="checkbox"/>
<input type="checkbox"/> Environmental Report	<input type="checkbox"/> Inspection Plan	_____	<input type="checkbox"/>
<input type="checkbox"/> Environmental Permit	<input type="checkbox"/> Inventory Adjustment Request	_____	<input type="checkbox"/>

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Document Number/Revision	Document Number/Revision	Document Number/Revision
_____	_____	_____
_____	_____	_____
_____	_____	_____

20. Approvals

Signature	Date	Signature	Date
<u>OPERATIONS AND ENGINEERING</u>		<u>ARCHITECT-ENGINEER</u>	
Cog./Project Engineer <u>[Signature]</u>	<u>6/8/92</u>	PE <u>[Signature]</u>	<u>6-5-92</u>
Cog./Project Engr. Mgr. <u>[Signature]</u>	<u>6/2/92</u>	QA <u>[Signature]</u>	<u>6/5/92</u>
QA <u>C.E. Nodan (S data)</u>	<u>6-8-92</u>	Safety <u>[Signature]</u>	<u>6-5-92</u>
Safety <u>David A. Connors</u>	<u>6/9/92</u>	Design <u>[Signature]</u>	<u>6-5-92</u>
Security _____	_____	Other ENV <u>David G. Fort</u>	<u>6-5-92</u>
Proj. Prog./Dept. Mgr. _____	_____	PE <u>Larry Kessis</u>	<u>6/5/92</u>
Def. React. Div. _____	_____	_____	_____
Chem. Proc. Div. _____	_____	_____	_____
Def. Wst. Mgmt. Div. _____	_____	<u>DEPARTMENT OF ENERGY</u>	_____
Adv. React. Dev. Div. _____	_____		_____
Proj. Dept. _____	_____	<u>ADDITIONAL</u>	_____
Environ. Div. _____	_____	_____	_____
IRM Dept. _____	_____	_____	_____
Facility Rep. (Ops) <u>Larry Coughlin</u>	<u>6/8/92</u>	_____	_____
Other (FPP) <u>P.J.M. Kenna</u>	<u>6-8-92</u>	_____	_____

ENGINEERING CHANGE NOTICE

Page 1 of 4

1. ECN 131595

Proj. ECN W-011-46

2. ECN Category (mark one) Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Supersedure <input type="checkbox"/> Discovery <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. <u>E. PENNALA KEH CM 372-1990</u>		4. Date <u>5-4-92</u>	
	5. Project Title/No./Work Order No. <u>CR9396</u> <u>W/SCF SITEWORK (W-011H)</u>	6. Bldg./Sys./Fac. No. <u>6266</u>	7. Impact Level <u>3 / SC 3</u>	
	8. Document Number Affected (include rev. and sheet no.) <u>SEE BLOCK 12</u>	9. Related ECN No(s). <u>N/A</u>	10. Related PO No. <u>N/A</u>	
11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input type="checkbox"/> No (NA Blks. 11b, 11c, 11d) <u>UNKNOWN</u>	11b. Work Package Doc. No. <u>UNKNOWN</u>	11c. Complete Installation Work <u>N/A</u> Cog. Engineer Signature & Date	11d. Complete Restoration (Temp. ECN only) <u>N/A</u> Cog. Engineer Signature & Date	

12. Description of Change SC-3

- 1.) W-011H-C1, REV. 1 SECTION 02730, PARAGRAPH 3.2.1.5
 REVISE PARAGRAPH TO READ: "PERFORM TESTS AFTER LINES HAVE BEEN FLUSHED."
- 2.) DRAWING H-6-1677 SHT. 2 REV. 1, REVISE TERMINATION OF CONTAMINATED DRAIN LINE PER REVISED DETAILS 4 & 6 AS SHOWN ON SKETCHES ON PAGES 3 & 4 OF THIS ECN.
- 3.) W-011H-C1, REV. 1, SECTION 02745, PARAGRAPH 3.2.2.5. REVISE PARAGRAPH TO READ: "PERFORM TESTS AFTER LINES HAVE BEEN FLUSHED."



EXPIRES 10-11-93

Items 1 & 3 Only

13a. Justification (mark one) Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found- <input type="checkbox"/> Facilitate Const. <input checked="" type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission <input type="checkbox"/>	13b. Justification Details <u>1) DUE TO SAFETY CONSIDERATIONS, TRENCH FOR SANITARY SEWER LINE NEEDS TO BE BACK-FILLED AS SOON AS POSSIBLE.</u> <u>2) BETTER DIVISION OF WORK SCOPE NEEDS TO BE SHOWN BETWEEN PACKAGE 2 AND PACKAGE 3.</u>
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14. Distribution (include name, MSIN, and no. of copies)	
<u>KEH DISTRIBUTION</u>	A. V. Lincoln S2-62
Const Doc Cntl E2-50	P. J. McKenna R3-54
<u>WHC DISTRIBUTION</u>	C. B. McVey H1-61
Central Files L8-04	T. G. Montgomery T6-12
Project Files R1-28	M. C. Prather L5-07
D. A. Connors, IV T6-10	F. W. Ringe S1-54
L. L. Curfman [2] T6-12	E. A. Smith L5-07
J. J. Dorian B2-16	T. L. Sweet S4-01
J. K. Epperley R1-29	J. E. Witherspoon (PE) [2] R3-35
S. S. Glover R3-54	DOE: M. S. Collins A5-18
	STA. 6 T2-03
	STA. 30 A3-29
	Lupe Garza L6-76

RELEASE STAMP

OFFICIAL RELEASE (5)
 BY WHC
 DATE MAY 26 1992
Sta. 4

ENGINEERING CHANGE NOTICE

Page 2 of 4

1. ECN (use no. from pg. 1)

W-011-46

15. Design Verification Required

Yes
 No

16. Cost Impact

ENGINEERING

Additional \$ 600
Savings \$ _____

CONSTRUCTION

Additional \$ +600
Savings \$ CREDIT ON PACKAGE 3

17. Schedule Impact (days)

Improvement TBD
Delay _____

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD <input type="checkbox"/> Functional Design Criteria <input type="checkbox"/> Operating Specification <input type="checkbox"/> Criticality Specification <input type="checkbox"/> Conceptual Design Report <input type="checkbox"/> Equipment Spec. <input type="checkbox"/> Const. Spec. <input type="checkbox"/> Procurement Spec. <input type="checkbox"/> Vendor Information <input type="checkbox"/> OM Manual <input type="checkbox"/> FSAR/SAR <input type="checkbox"/> Safety Equipment List <input type="checkbox"/> Radiation Work Permit <input type="checkbox"/> Environmental Impact Statement <input type="checkbox"/> Environmental Report <input type="checkbox"/> Environmental Permit <input type="checkbox"/>	Seismic/Stress Analysis <input type="checkbox"/> Stress/Design Report <input type="checkbox"/> Interface Control Drawing <input type="checkbox"/> Calibration Procedure <input type="checkbox"/> Installation Procedure <input type="checkbox"/> Maintenance Procedure <input type="checkbox"/> Engineering Procedure <input type="checkbox"/> Operating Instruction <input type="checkbox"/> Operating Procedure <input type="checkbox"/> Operational Safety Requirement <input type="checkbox"/> IEPD Drawing <input type="checkbox"/> Cell Arrangement Drawing <input type="checkbox"/> Essential Material Specification <input type="checkbox"/> Fac. Proc. Samp. Schedule <input type="checkbox"/> Inspection Plan <input type="checkbox"/> Inventory Adjustment Request <input type="checkbox"/>	Tank Calibration Manual <input type="checkbox"/> Health Physics Procedure <input type="checkbox"/> Spares Multiple Unit Listing <input type="checkbox"/> Test Procedures/Specification <input type="checkbox"/> Component Index <input type="checkbox"/> ASME Coded Item <input type="checkbox"/> Human Factor Consideration <input type="checkbox"/> Computer Software <input type="checkbox"/> Electric Circuit Schedule <input type="checkbox"/> ICRS Procedure <input type="checkbox"/> Process Control Manual/Plan <input type="checkbox"/> Process Flow Chart <input type="checkbox"/> Purchase Requisition <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/>
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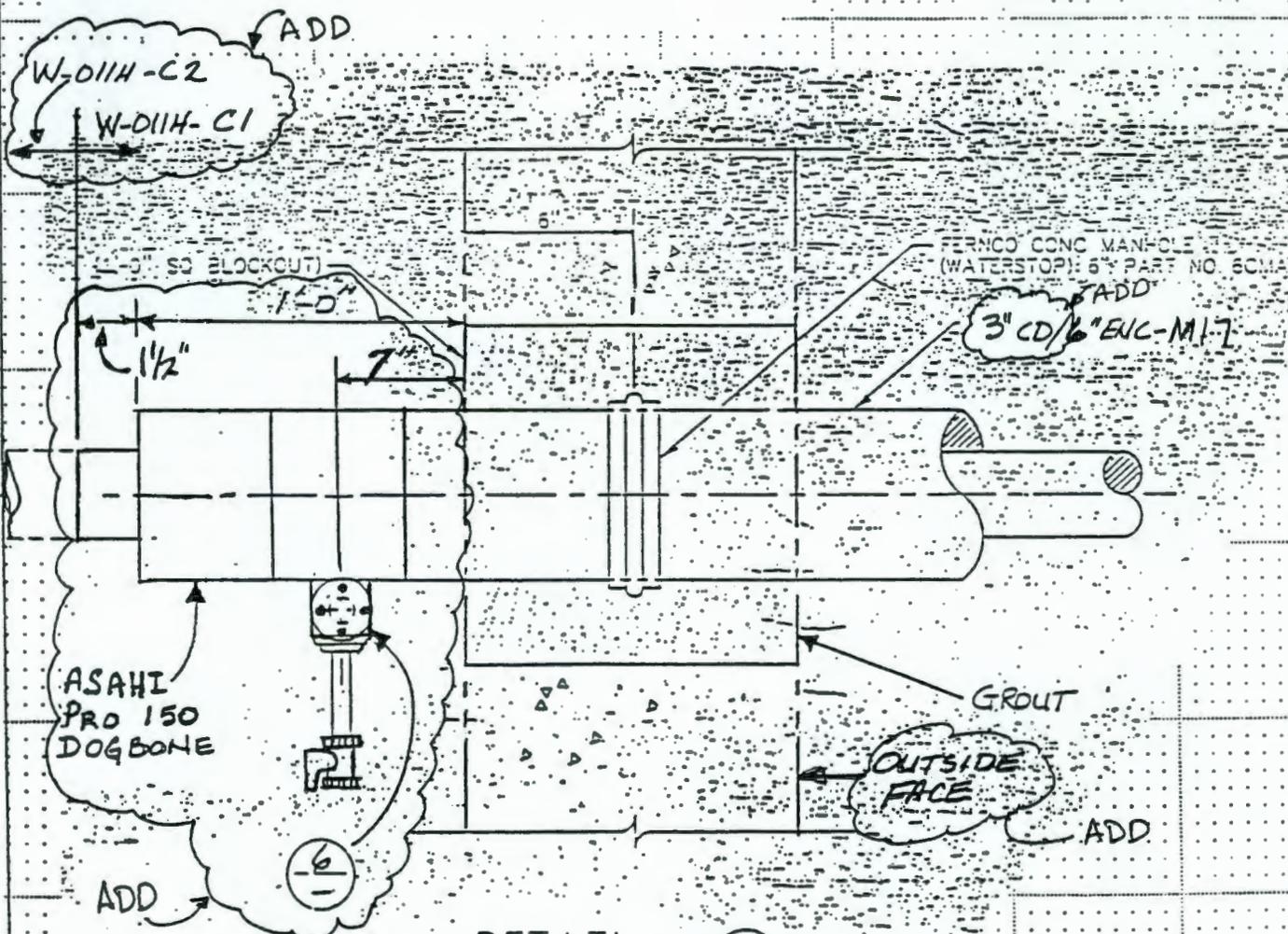
19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
_____	_____	_____
_____	_____	_____
_____	_____	_____

20. Approvals

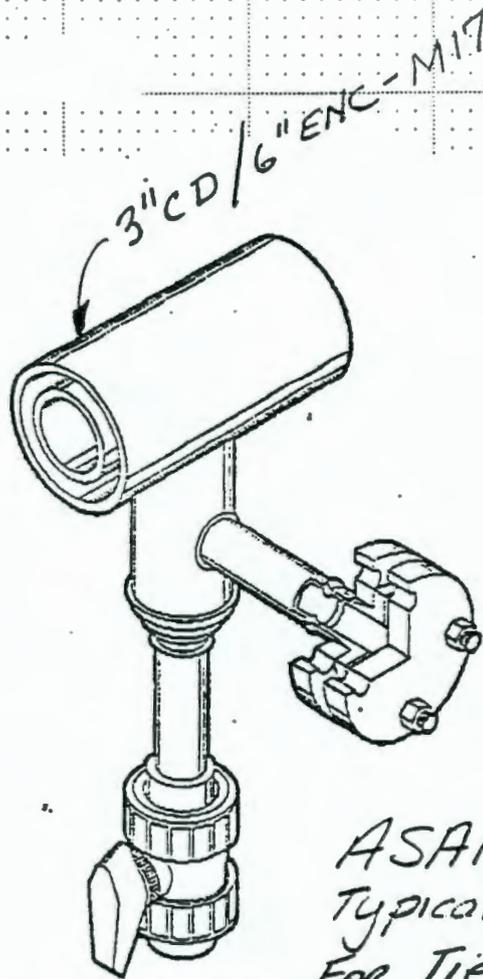
Signature	Date	Signature	Date
<u>OPERATIONS AND ENGINEERING</u>		<u>ARCHITECT-ENGINEER</u>	
Cog./Project Engineer <u>[Signature]</u>	<u>5/26/92</u>	PE <u>[Signature]</u>	<u>5/26/92</u>
Cog./Project Engr. Mgr. <u>[Signature]</u>	<u>5/26/92</u>	QA <u>[Signature]</u>	<u>5/26/92</u>
QA <u>[Signature]</u>	<u>5/26/92</u>	Safety <u>[Signature]</u>	<u>5-26-92</u>
Safety _____	_____	Design <u>M. T. Husain</u>	<u>5/21/92</u>
Security _____	_____	Other <u>ENV. David Lytle Fort</u>	<u>5/22/92</u>
Proj. Prog./Dept. Mgr. _____	_____	<u>PLE Amy Koss</u>	<u>5/21/92</u>
Def. React. Div. _____	_____	_____	_____
Chem. Proc. Div. _____	_____	_____	_____
Def. Wst. Mgmt. Div. _____	_____	<u>DEPARTMENT OF ENERGY</u>	_____
Adv. React. Dev. Div. _____	_____	_____	_____
Proj. Dept. _____	_____	<u>ADDITIONAL</u>	_____
Environ. Div. _____	_____	_____	_____
IRM Dept. _____	_____	_____	_____
Facility Rep. (Ops) _____	_____	_____	_____
Other _____	_____	_____	_____

Ref. Dwg. H-6-1677	Sh. 2	Rev. 1	Prepared By E. PENJALA	Checked By M. T. Husaini	ECN No. W-011-46	Page 3
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DETAIL (4)
SCALE: NONE H-6-1677 SH. 1

Ref. Dwg. H-6-1677	Sh. 2	Rev. 1	Prepared By E. Pennala	Checked By M.T. Hussain	ECN No. W-011-46	Page 4
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ASAHI/AMERICA
Typical Arrangement
For Tie-ins to Instrument
Probes.

DETAIL
SCALE: NONE

6
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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 171997
 Proj. ECN W-011-42

2. ECN Category (mark one)
- Supplemental
 - Direct Revision
 - Change ECN
 - Temporary
 - Supersedure
 - Discovery
 - Cancel/Void

3. Originator's Name, Organization, MSIN, and Telephone No.
E. Pennala K&H-CM 373-2275

4. Date
4-23-92

5. Project Title/No./Work Order No. CR 9396
WSCF Sitework (W-011H)

6. Bldg./Sys./Fac. No.
6266

7. Impact Level 3Q
SAFETY CLASS 3

8. Document Number Affected (include rev. and sheet no.)
SPEC. W-011H-C1 Rev. 1

9. Related ECN No(s).
W-011-39 for item 1

10. Related PO No.
N/A

11a. Modification Work
 Yes (fill out Blk. 11b)
 No (NA Blks. 11b)
UNKNOWN

11b. Work Package Doc. No.
UNKNOWN

11c. Complete Installation Work
N/A
 Cog. Engineer Signature & Date

11d. Complete Restoration (Temp. ECN only)
N/A
 Cog. Engineer Signature & Date

12. Description of Change SC.3

1) SECTION 02785, PARAGRAPH 2.2.2.
 REVISE SECOND SENTENCE IN PARAGRAPH TO READ AS FOLLOWS:
 "Provide and install 100 AMP slow operating fuses in Fused Cutouts."

2.) SECTION 16300, PARAGRAPH 2.2.3
 REVISE PARAGRAPH TO READ AS FOLLOWS:
 "2.2.3 FUSED CUTOUTS: Open type rated 15kV, 100 Amp, S & C type, SMD 20 or Similar With SMU-20 fuse units."
 EXTRA-HEAVY-DUTY *ee slider*

- 13a. Justification (mark one)
- Criteria Change
 - Design Improvement
 - Environmental
 - As-Found
 - Facilitate Const.
 - Const. Error/Omission
 - Design Error/Omission

13b. Justification Details

1. OWNER shall not be supplying fuses.

2. INCORRECT size of fused ^{cutout} in original specification. ~~3~~

14. Distribution (include name, MSIN, and no. of copies)

<u>KEH DISTRIBUTION</u>	Lincoln	S2-62
Const Doc Cntl	P. J. McKenna	R3-54
<u>WHC DISTRIBUTION</u>	C. B. McVey	H1-61
Central Files	T. G. Montgomery	T6-12
Project Files	M. C. Prather	L5-07
D. A. Conners, IV	F. W. Ringe	S1-54
L. L. Curfman [2]	E. A. Smith	L5-07
J. J. Dorian	T. L. Sweet	S4-01
J. K. Epperley	J. E. Witherspoon (PE) [2]	R3-35
S. S. Glover	DOE: M. S. Collins	A5-18

RELEASE STAMP

OFFICIAL RELEASE

BY WHC

DATE **MAY 18 1992**

STA 4

STA 10
STA 6
L. GARZA

TS-87
TS-03
L6-76

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1)

W-011-42

15. Design Verification Required

Yes
 No

16. Cost Impact

ENGINEERING

Additional \$ 200
Savings \$ _____

CONSTRUCTION

Additional \$ 300
Savings \$ _____

17. Schedule Impact (days)

Improvement 0
Delay _____

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

<p>SDD/DD <input type="checkbox"/></p> <p>Functional Design Criteria <input type="checkbox"/></p> <p>Operating Specification <input type="checkbox"/></p> <p>Criticality Specification <input type="checkbox"/></p> <p>Conceptual Design Report <input type="checkbox"/></p> <p>Equipment Spec. <input type="checkbox"/></p> <p>Const. Spec. <input type="checkbox"/></p> <p>Procurement Spec. <input type="checkbox"/></p> <p>Vendor Information <input type="checkbox"/></p> <p>OM Manual <input type="checkbox"/></p> <p>FSAR/SAR <input type="checkbox"/></p> <p>Safety Equipment List <input type="checkbox"/></p> <p>Radiation Work Permit <input type="checkbox"/></p> <p>Environmental Impact Statement <input type="checkbox"/></p> <p>Environmental Report <input type="checkbox"/></p> <p>Environmental Permit <input type="checkbox"/></p>	<p>Seismic/Stress Analysis <input type="checkbox"/></p> <p>Stress/Design Report <input type="checkbox"/></p> <p>Interface Control Drawing <input type="checkbox"/></p> <p>Calibration Procedure <input type="checkbox"/></p> <p>Installation Procedure <input type="checkbox"/></p> <p>Maintenance Procedure <input type="checkbox"/></p> <p>Engineering Procedure <input type="checkbox"/></p> <p>Operating Instruction <input type="checkbox"/></p> <p>Operating Procedure <input type="checkbox"/></p> <p>Operational Safety Requirement <input type="checkbox"/></p> <p>IEFD Drawing <input type="checkbox"/></p> <p>Cell Arrangement Drawing <input type="checkbox"/></p> <p>Essential Material Specification <input type="checkbox"/></p> <p>Fac. Proc. Samp. Schedule <input type="checkbox"/></p> <p>Inspection Plan <input type="checkbox"/></p> <p>Inventory Adjustment Request <input type="checkbox"/></p>	<p>Tank Calibration Manual <input type="checkbox"/></p> <p>Health Physics Procedure <input type="checkbox"/></p> <p>Spares Multiple Unit Listing <input type="checkbox"/></p> <p>Test Procedures/Specification <input type="checkbox"/></p> <p>Component Index <input type="checkbox"/></p> <p>ASME Coded Item <input type="checkbox"/></p> <p>Human Factor Consideration <input type="checkbox"/></p> <p>Computer Software <input type="checkbox"/></p> <p>Electric Circuit Schedule <input type="checkbox"/></p> <p>ICRS Procedure <input type="checkbox"/></p> <p>Process Control Manual/Plan <input type="checkbox"/></p> <p>Process Flow Chart <input type="checkbox"/></p> <p>Purchase Requisition <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p>
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19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
_____	_____	_____
_____	_____	_____
_____	_____	_____

20. Approvals

Signature	Date	Signature	Date
<u>OPERATIONS AND ENGINEERING</u>		<u>ARCHITECT-ENGINEER</u>	
Cog./Project Engineer <u>[Signature]</u>	<u>5/14/92</u>	RE <u>[Signature]</u>	<u>5/13/92</u>
Cog./Project Engr. Mgr. <u>[Signature]</u>	<u>5/14/92</u>	QA <u>[Signature]</u>	<u>4-30-92</u>
QA <u>[Signature]</u>	<u>5/14/92</u>	Safety <u>[Signature]</u>	<u>4-29-92</u>
Safety _____	_____	Design <u>[Signature]</u>	<u>4/29/92</u>
Security _____	_____	Other (ENV.) <u>[Signature]</u>	<u>4/29/92</u>
Proj. Prog./Dept. Mgr. _____	_____	PLE <u>[Signature]</u>	<u>4/29/92</u>
Def. React. Div. _____	_____	<u>DEPARTMENT OF ENERGY</u>	
Chem. Proc. Div. _____	_____	<u>ADDITIONAL</u>	
Def. Wst. Mgmt. Div. _____	_____	_____	_____
Adv. React. Dev. Div. _____	_____	_____	_____
Proj. Dept. _____	_____	_____	_____
Environ. Div. _____	_____	_____	_____
IRM Dept. _____	_____	_____	_____
Facility Rep. (Ops) <u>[Signature]</u>	<u>5/14/92</u>	_____	_____
Other <u>[Signature]</u>	<u>5/14/92</u>	_____	_____

ENGINEERING CHANGE NOTICE

Page 1 of 4

1. ECN 128375
 Proj. ECN W-011-39

2. ECN Category (mark one) <input checked="" type="checkbox"/> Supplemental <input type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Supersedure <input type="checkbox"/> Discovery <input type="checkbox"/> Cancel/Void	3. Originator's Name, Organization, MSIN, and Telephone No. <u>ERIC PENNALA KEH-CM 373-2275</u>	4. Date <u>4-15-92</u>
	5. Project Title/No./Work Order No. <u>CR9396</u> <u>WSCF sitework (W-011H)</u>	6. Bldg./Sys./Fac. No. <u>6266</u>
	8. Document Number Affected (include rev. and sheet no.) <u>See Block 12</u>	9. Related ECN No(s). <u>W-011-34 for item 2</u> <u>W-011-38 for item 4</u>
		7. Impact Level <u>3/</u> <u>SAFETY CLASS 3</u>
		10. Related PO No. <u>N/A</u>

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> No (NA Blks. 11b, <u>UNKNOWN</u>	11b. Work Package Doc. No. <u>UNKNOWN</u>	11c. Complete Installation Work <u>N/A</u> Cog. Engineer Signature & Date	11d. Complete Restoration (Temp. ECN only) <u>N/A</u> Cog. Engineer Signature & Date
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12. Description of Change SC-3

- 1.) DWG. H-6-1684 SHT 1 REV 0 CONTAMINATED VAULT PLAN.
 ZONE F5 - ELIMINATE (TYP) ON NOTE FOR 2" conduit sleeve and add note with arrow to show 2 1/2" conduit sleeve for the 1 1/2" PUC COATED RIGID CND.
- 2.) DWG. H-6-1683 SHT 7 REV 0 TELECOMMUNICATION DETAILS.
 ZONE F2-F3 - REVISE DETAIL C AS SHOWN ON PAGE 3 OF THIS ECN.
- 3.) DWG. H-6-1683 SHT 3. REV 0 REVISE note 3 to read sht 2 instead of sht 3.
- 4.) DWG. H-6-1683 SHT 5. REV 1. REVISE DUCTBANK details for LOCATIONS OF FODUCT in telecom, conduits per SKETCH ON PAGE 4 OF THIS ECN.
- 5.) CONSTRUCTION SPECIFICATION W-011H-C1, SECTION 2785, paragraph 2.2.2 REV 1.
 REVISE second sentence in paragraph to read as follows: "Fuses to be 6SAMP RTE."
- 6.) DWG. H-6-1683 SHT. 2, REV. 1 REVISE NOTE 2 TO READ "SEE SHEETS 3 & 4 FOR ACTUAL POLE ATTACHMENT LOCATION"

13a. Justification (mark one) <input type="checkbox"/> Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found <input checked="" type="checkbox"/> Facilitate Const. <input type="checkbox"/> Const. Error/Omission <input checked="" type="checkbox"/> Design Error/Omission	13b. Justification Details 1.) 1 1/2 Conduit cannot fit in 2" sleeve must be 2 1/2" 2.) Telecom Conduit must be lowered to not interfere with Power conduit ductbank from M-1 3.) Typo 4.) Need to move foduct to allow ease of installation 5.) TO EXPEDITE SCHEDULE, HAVE CONTRACTOR 1, 2, 3, 6 UP POWER POLE
---	---

14. Distribution (include name, MSIN, and no. of copies)

<u>KEH DISTRIBUTION</u>	A. V. Lincoln S2-62	V. Lincoln S2-62
Const Doc Cntl	E2-50	P. J. McKenna R3-54
<u>WHC DISTRIBUTION</u>		C. B. McVey T6-07
Central Files	L8-04	T. G. Montgomery T6-12
Project Files	R1-28	M. C. Prather L5-07
D. A. Conners, IV	T6-10	F. W. Ringe S1-54
L. L. Curfman [2]	T6-12	E. A. Smith L5-07
J. J. Dorian	B2-16	T. L. Sweet S4-01
J. K. Epperley	R1-29	J. E. Witherspoon (PE) [2] R3-35
S. S. Glover	R3-54	DOE: M. S. Collins A5-18

RELEASE STAMP Purchase

OFFICIAL RELEASE 11

BY WHC

DATE **APR 21 1992**

Station 4

Sta. 6 T2-03
 Sta. 10 A3-87
 Lupe Garza L6-76

ENGINEERING CHANGE NOTICE

Page 2 of 4

1. ECN (use no. from pg. 1)
W-011-39

15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact <table style="width: 100%;"> <tr> <td style="text-align: center;">ENGINEERING</td> <td style="text-align: center;">CONSTRUCTION</td> </tr> <tr> <td>Additional <input checked="" type="checkbox"/> \$ <u>250</u></td> <td>Additional <input checked="" type="checkbox"/> \$ <u>0</u></td> </tr> <tr> <td>Savings <input type="checkbox"/> \$ _____</td> <td>Savings <input type="checkbox"/> \$ _____</td> </tr> </table>	ENGINEERING	CONSTRUCTION	Additional <input checked="" type="checkbox"/> \$ <u>250</u>	Additional <input checked="" type="checkbox"/> \$ <u>0</u>	Savings <input type="checkbox"/> \$ _____	Savings <input type="checkbox"/> \$ _____	17. Schedule Impact (days) Improvement <input type="checkbox"/> <u>TBD</u> Delay <input type="checkbox"/> _____
ENGINEERING	CONSTRUCTION							
Additional <input checked="" type="checkbox"/> \$ <u>250</u>	Additional <input checked="" type="checkbox"/> \$ <u>0</u>							
Savings <input type="checkbox"/> \$ _____	Savings <input type="checkbox"/> \$ _____							

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

<input type="checkbox"/> SDD/DD	<input type="checkbox"/> Seismic/Stress Analysis	<input type="checkbox"/> Tank Calibration Manual
<input type="checkbox"/> Functional Design Criteria	<input type="checkbox"/> Stress/Design Report	<input type="checkbox"/> Health Physics Procedure
<input type="checkbox"/> Operating Specification	<input type="checkbox"/> Interface Control Drawing	<input type="checkbox"/> Spares Multiple Unit Listing
<input type="checkbox"/> Criticality Specification	<input type="checkbox"/> Calibration Procedure	<input type="checkbox"/> Test Procedures/Specification
<input type="checkbox"/> Conceptual Design Report	<input type="checkbox"/> Installation Procedure	<input type="checkbox"/> Component Index
<input type="checkbox"/> Equipment Spec.	<input type="checkbox"/> Maintenance Procedure	<input type="checkbox"/> ASME Coded Item
<input type="checkbox"/> Const. Spec.	<input type="checkbox"/> Engineering Procedure	<input type="checkbox"/> Human Factor Consideration
<input type="checkbox"/> Procurement Spec.	<input type="checkbox"/> Operating Instruction	<input type="checkbox"/> Computer Software
<input type="checkbox"/> Vendor Information	<input type="checkbox"/> Operating Procedure	<input checked="" type="checkbox"/> Electric Circuit Schedule
<input type="checkbox"/> OM Manual	<input type="checkbox"/> Operational Safety Requirement	<input type="checkbox"/> ICRS Procedure
<input type="checkbox"/> FSAR/SAR	<input type="checkbox"/> IEFD Drawing	<input type="checkbox"/> Process Control Manual/Plan
<input type="checkbox"/> Safety Equipment List	<input type="checkbox"/> Cell Arrangement Drawing	<input type="checkbox"/> Process Flow Chart
<input type="checkbox"/> Radiation Work Permit	<input type="checkbox"/> Essential Material Specification	<input type="checkbox"/> Purchase Requisition
<input type="checkbox"/> Environmental Impact Statement	<input type="checkbox"/> Fac. Proc. Samp. Schedule	_____
<input type="checkbox"/> Environmental Report	<input type="checkbox"/> Inspection Plan	_____
<input type="checkbox"/> Environmental Permit	<input type="checkbox"/> Inventory Adjustment Request	_____

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
_____	_____	_____
_____	_____	_____
_____	_____	_____

20. Approvals

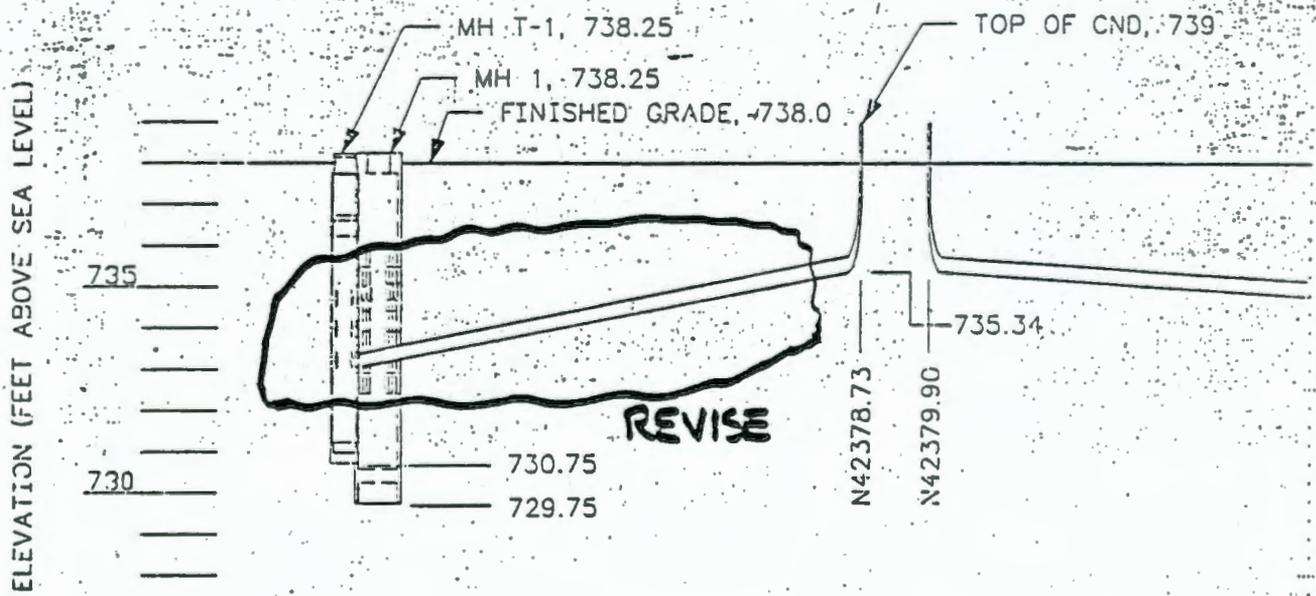
Signature	Date	Signature	Date
<u>OPERATIONS AND ENGINEERING</u>		<u>ARCHITECT-ENGINEER</u>	
Cog./Project Engineer <u>[Signature]</u>	<u>4/20/92</u>	PE <u>[Signature]</u>	<u>4-17-92</u>
Cog./Project Engr. Mgr. <u>[Signature]</u>	<u>4/20/92</u>	QA <u>[Signature]</u>	<u>4-17-92</u>
QA <u>[Signature]</u>	<u>4/20/92</u>	Safety <u>[Signature]</u>	<u>4-16-92</u>
Safety _____	_____	Design <u>TELECOM. [Signature]</u>	<u>4/16/92</u>
Security _____	_____	Other ENV. <u>[Signature]</u>	<u>4/17/92</u>
Proj. Prog./Dept. Mgr. _____	_____	ELECT <u>[Signature]</u>	<u>4/16/92</u>
Def. React. Div. _____	_____	PLE <u>[Signature]</u>	_____
Chem. Proc. Div. _____	_____	<u>DEPARTMENT OF ENERGY</u>	
Def. Wst. Mgmt. Div. _____	_____	_____	
Adv. React. Dev. Div. _____	_____	_____	
Proj. Dept. _____	_____	_____	
Environ. Div. _____	_____	<u>ADDITIONAL</u>	
IRM Dept. _____	_____	_____	
Facility Rep. (Ops) <u>[Signature]</u>	<u>4/20/92</u>	_____	
Other _____	_____	_____	
_____	_____	_____	
_____	_____	_____	

Rei. Dwg. H-6-1683	Sh. 7	Rev. ①	Prepared By E. Pennala	Checked By M. Reil	ECN No. W011-39	Page 3/4
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ZONE F2-3

3

2



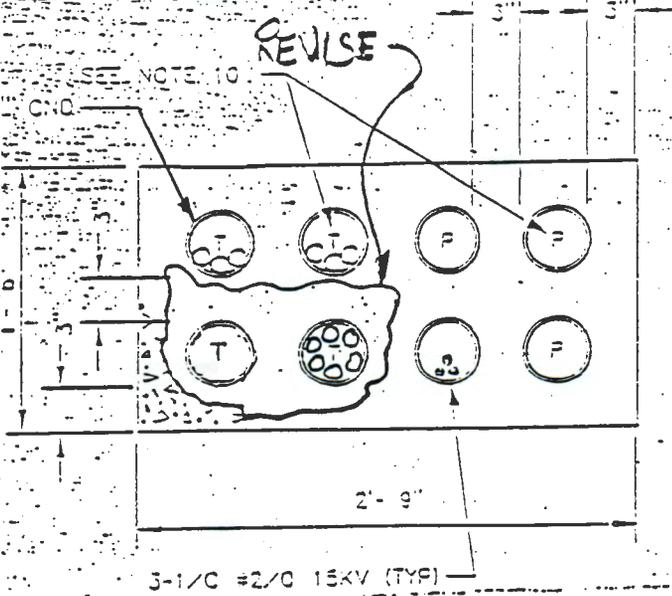
PROFILE OF FUTURE TELECOMMUNICATION CONDUIT

SCALE: HORIZ: 1" = 20'
VERT: 1.5" = 5'

C
SH 5

Ref. Dwg. H-6-1683	Sh. 5	Rev. 1	Prepared By E. Pennala	Checked By m p. d.	ECN No. W-011-39	Page 4 14
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ZONE BB

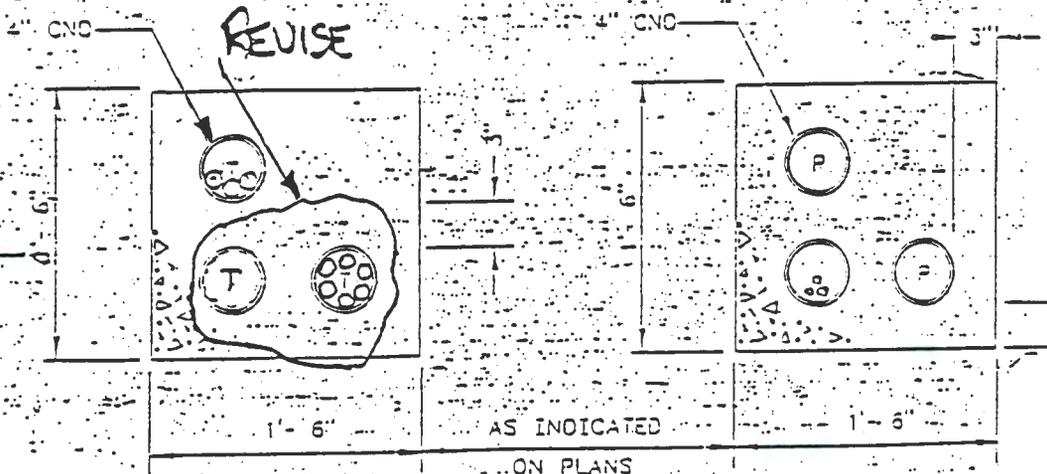


SECTION



NTS
(SEE NOTES 2,3,4,5 & 6)
P - POWER
T - TELECOMMUNICATIONS

ZONE BA



SECTION



NTS
(SEE NOTES 2,3,4,5 & 6)
P - POWER
T - TELECOMMUNICATIONS

ENGINEERING CHANGE NOTICE

Page 1 of 85

1. ECN 128364
 Proj. ECN W-011-28

2. ECN Category (mark one) <input checked="" type="checkbox"/> Supplemental <input type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Supersedure <input type="checkbox"/> Discovery <input type="checkbox"/> Cancel/Void	3. Originator's Name, Organization, MSIN, and Telephone No. Eric Pennala, KEH CM, 373-2275	4. Date February 4, 1992
	5. Project Title/No./Work Order No. <u>CR9396</u> WSCF Sitework (W-011H)	6. Bldg./Sys./Fac. No. <u>6266</u>
	8. Document Number Affected (include rev. and sheet no.) See Block 12	9. Related ECN No(s). N/A
		7. Impact Level 3 / SC-3
		10. Related PO No. N/A

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input type="checkbox"/> No (NA Blks. 11b, 11c, 11d) Unknown	11b. Work Package Doc. No. Unknown	11c. Complete Installation Work N/A Cog. Engineer Signature & Date	11d. Complete Restoration (Temp. ECN only) N/A Cog. Engineer Signature & Date
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12. Description of Change SC-3

1. Specification W-011H-C1, Rev. 1, Section 02200, paragraph 3.2.1.4.d:
 REVISE to read as follows: "Backfill around sides and up to one foot above top of pipe or conduit with bedding material, compact with care to avoid misalignment of pipe, and provide uniform bearing along barrel of pipe."
- ~~2. Specification W-011H-C1, Rev. 1, Section 02650, paragraph 3.1.12.4:
 DELETE paragraph.~~ *2-13-92*
2/13/92
3. Specification W-011H-C1, Rev. 1, Section 02745, paragraph 1.2.8:
 REVISE reference paragraph to read 2.1.12 in place of 2.1.2.
4. Drawing H-6-1676, Sht 3, Rev. 0:
 Zone B-6 - Delete stainless steel basket and related note.
 Zone B-6 - Note was: 8" SNS FROM SEPTIC TANK
 to be: 8" SNS - EFFLUENT FROM SEPTIC TANK SHALL BE FILTERED + SEE SPEC. W-011H-C1, SECTION 02745

See Attached.



David Lyle Fort
2/7/92
2/18/92
df

EXPIRES 10/11/93

13a. Justification (mark one) <input checked="" type="checkbox"/> Criteria Change <u>4,7,8,9</u> <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found <input checked="" type="checkbox"/> Facilitate Const. <u>1, X, 6</u> <input type="checkbox"/> Const. Error/Omission <input checked="" type="checkbox"/> Design Error/Omission <u>3, 5, 12, 11</u>	13b. Justification Details <ol style="list-style-type: none"> 1. To eliminate unnecessary Title III testing and time consuming construction steps for water line installation. 2. Hanford water capacities in 200 West cannot meet WPA criteria for flushing. Sufficient flushing shall be accomplished by following paragraph 3.1.12.2. <i>2-13-92</i> <i>2/13/92</i> 3. Typographic error.
--	--

14. Distribution (include name, MSIN, and no. of copies)

KEH DISTRIBUTION Const Doc Cntl E2-50 WHC DISTRIBUTION Central Files L8-15 Engineering Files A3-80 Project Files R1-28 D. A. Conners, IV T6-10 L. L. Curfman [2] T6-12 J. J. Dorian B2-16 J. K. Epperley R1-29 S. S. Glover R3-54	A. V. Lincoln S2-62 P. J. McKenna R3-54 C. B. McVey T6-07 T. G. Montgomery T6-12 M. C. Prather L5-07 F. W. Ringe S1-54 E. A. Smith L5-07 T. L. Sweet S4-01 J. E. Witherspoon (PE) [2] R3-27 DOE: M. S. Collins A5-18
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RELEASE STAMP

OFFICIAL RELEASE 13

BY WHC

DATE FEB 20 1992

STA 4

STA 10 A3-89
 STA 6 T2-03
 WREGANZA A3-80

A-7900-013 (11/88)

5.) Specification W-011H-C1, Rev. 1 Section 02745

a.) Revise Paragraph 2.1.10 to read as follows:

2.1.10 Swing Check Valves: Class 125 cast iron body conforming to ASTM A126 Class B with bronze disk and trim.

b.) Revise paragraph 2.1.11 to read as follows:

2.1.11 Butterfly Valves: Cast iron body conforming to ASTM A126 Class B. The disc shall be bronze and the seat material shall be Buna-N. Stem materials shall be type 316 stainless steel. The operator handle shall be a multi-position locking lever handle.

6.) Specification W-011H-C1, Rev. 1, Section 02745, Subparagraph 2.2.4.2 Pump design.

a.) Revise the 3rd and 4th sentences of Subparagraph 2.2.4.2.b to read as follows:

... The weight of the pumping unit shall be guided by at least one guide bar and the units discharge shall be held tightly against the discharge elbow when the unit is in place. Gasketed interfaces employed at the pump discharge shall not require service personnel to enter the dosing chamber to replace, clean or repair the mating surfaces and/or gasket. ...

b.) Delete the 3rd and 4th sentences of paragraph 2.2.4.3.e

The sentences start with: The stator ...
and finishing with: ... is not acceptable.

c.) Revise the first sentence of paragraph 2.2.4.3.h to read as follows:

h. Pump shaft shall be of AISI type 300 or 400 series stainless steel. ...

d.) Revise Subparagraph 2.2.4.3.i to read as follows:

i. Each pump shall be provided with a tandem mechanical shaft seal system. The upper mechanical seal shall operate entirely in an oil chamber located just below the stator housing. This upper mechanical seal shall function as a secondary barrier between the pumped liquid and the stator housing. The lower set of mechanical seals shall function as the primary barrier.

e.) Delete Subparagraphs 2.2.4.3.j and k. in their entirety.

f.) Revise the first sentence of Subparagraph 2.2.4.3.l. to read as follows:

1. The impeller shall be of ductile iron conforming to ASTM A395 or cast iron conforming to ASTM A48 Class 30. ...

g.) Revise Subparagraph 2.2.4.3.p to read as follows:

p. The pump motor cable shall be type SO and suitable for submersible pump application. Cable sizing shall conform to NEC specifications for pump motors.

- 7.) Specification W-011H-C1 Rev. 1, Section 02745, Paragraph 2.2.5
Add the following paragraphs:

- 2.2.5 Septic Tank Effluent Filter Assembly.
- 2.2.5.1 Filter assembly shall consist of a cartridge style filter and housing constructed of corrosive resistant materials and designed for installation inside of septic tank.
- 2.2.5.2 The filter assembly intake point shall be below the septic tank effluent discharge at a distance or 40% of the total liquid depth.
- 2.2.5.3 Filter/s shall remove all suspended particles 1/8 inch and larger.
- 2.2.5.4 Filter/s shall be easily removed for cleaning.
- 2.2.5.5 Filter/s shall be sized to process a minimum of 6500 gallons per day of effluent. If more than one filter assembly is required to meet flow criteria, connect multiple housings to a discharge header. Provide adequate access opening in the septic tank for the maintenance of the filter/s.
- 2.2.5.6 A representative product is Model A300 by Zabel Industries.

- 8.) Specification W-011H-C1 Rev. 1, Section 02745, Paragraph 2.2.1

Revise paragraph by replacing the last sentence with the following:

... Provide adequate access opening in the septic tank for the maintenance of the effluent filters, (see Paragraph 2.2.5). Provide risers to 6 inches above finished grade and sized equal to the tank access openings. Minimum access riser shall be 24 inches inside diameter and be provided with a cover fabricated from 1/4 inch steel plate or other similar stout material.

- 9.) Specification W-011H-C1 Rev. 1, Section 02745, Paragraph 3.1.2.

Revise Paragraph to read as follows:

- 3.1.2 Install septic tank and effluent filter assembly in accordance with approved submittals, manufacturers recommendations, and UPC Appendix I, Section 15.

- 10.) Specification W-011H-C1 Rev. 1, Section 02745, Paragraph 3.1.6.

Revise paragraph to read as follows:

- 3.1.6 Excavate, install, test, and backfill headers and risers in the locations shown on the Drawings prior to installing filter bed media. Run the risers minimum two feet above grade and temporarily cap.

- 11.) Specification W-011H-C1 Rev. 1, Section 09805 Special Protective Coating.

a.) Revise Subparagraph 2.1.3.2 to read as follows:

- 2.1.3.2 Phenoline 302 by Carboline Co., green.

b.) Insert paragraphs 2.1.4 and 2.1.4.1

- 2.1.4 Top Coat
- 2.1.4.1 Phenoline 305 by Carboline Co., light grey.

- c.) Insert paragraphs 2.1.5 and 2.1.5.1
- 2.1.5 Chemical Resistant Sealant
 - 2.1.5.1 Fluoroelastomer caulk and primer similar to Pelseal and PLV-2000 by Pelmor Laboratories Inc.
- d.) Insert Paragraph 3.2.5
- 3.2.5 Concrete exposed embedded items, except anchor bolts, shall be coated the same as the surrounding concrete surface.
- e.) Insert Subparagraph 3.3.4
- 3.3.4 Apply broadcast as recommended by coating manufacturer to all horizontal surfaces where foot traffic is possible.
- f.) Insert Paragraph 3.3.5
- 3.3.5 After final coat, apply chemical resistant sealant to all joints inside coated surface boundary. Roughen contact surfaces with sand paper. Mask limits of joint to provide a neat appearance. Prime and install sealant in accordance with manufacturer's recommendations.
- g.) Revise Paragraph 3.6.1 to read as follows:
- 3.6.1 Concrete
 - Prime: Phenoline 300 Orange 13-14 mils 8 mils
 - Finish: Phenoline 302 Green 13-14 mils 8 mils
 - Top: Phenoline 305 Grey 5-6 mils 3 mils

Block 13b. Justification Details (continued)

- 4.) New Washington State Requirements from Department of Health.
- 5.) Error in Code requirements for Valves in septic system.
- 6.) To Facilitate Construction Submittal from Fixed Price Contractor.
- 7,8,9.) New Washington State Requirements from Department of Health.
- 10.) Design of filter bed requires headers and risers to be placed in filter bed media and therefore cannot be installed per original sequence as stated.
- 11.) Original SPC for tank vault and loading pad only provided in green or black. Added top coat of similar system that can be provided in light gray and will have non-skid surface for pad and bottom of vault.

ENGINEERING CHANGE NOTICE

Page 1 of 3

1. ECN ~~172766~~
 Proj. ECN W-011-33

2. ECN Category (mark one) <input checked="" type="checkbox"/> Supplemental <input type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Supersedure <input type="checkbox"/> Discovery <input type="checkbox"/> Cancel/Void	3. Originator's Name, Organization, MSIN, and Telephone No. <p style="text-align: center;">D.L. Fort, KEH, E6-50, 6-4849</p>	4. Date <p style="text-align: center;">March 6, 1992</p>
	5. Project Title/No./Work Order No. <u>W-011H</u> <p style="text-align: center;">WSCF Sitework/CR9396</p>	6. Bldg./Sys./Fac. No. <p style="text-align: center;">6266</p>
	8. Document Number Affected (include rev. and sheet no.) <p style="text-align: center;">Spec W-011H-C1, Rev. 1</p>	9. Related ECN No(s). <p style="text-align: center;">W-011-28</p>
		7. Impact Level <p style="text-align: center;">3/SL3</p>
		10. Related PO No. <p style="text-align: center;">N/A</p>

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input type="checkbox"/> No (NA Blks. 11b, 11c, 11d) <p style="text-align: center;">UNKNOWN</p>	11b. Work Package Doc. No. <p style="text-align: center;">UNKNOWN</p>	11c. Complete Installation Work <p style="text-align: center;">N/A</p>	11d. Complete Restoration (Temp. ECN only) <p style="text-align: center;">N/A</p>
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12. Description of Change

Specification W-011H-C1, Revision 1
 Revise as indicated on page 3 of this ECN.

SC 3

13a. Justification (mark one) <input type="checkbox"/> Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> As-Found <input checked="" type="checkbox"/> Facilitate Const. <input type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission	13b. Justification Details <p style="text-align: center;">To accomodate contractor substitution request to provide a fiberglass septic tank.</p>
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14. Distribution (include name, MSIN, and no. of copies) <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"><u>KEH DISTRIBUTION</u></td> <td style="width: 30%;"></td> <td style="width: 40%;"></td> </tr> <tr> <td>Const Doc Cntl</td> <td>E2-50</td> <td>P. J. McKenna R3-54</td> </tr> <tr> <td><u>WHC DISTRIBUTION</u></td> <td></td> <td>C. B. McVey T6-07</td> </tr> <tr> <td>Central Files</td> <td>L8-15</td> <td>T. G. Montgomery T6-12</td> </tr> <tr> <td>Engineering Files</td> <td>A3-80</td> <td>M. C. Prather L5-07</td> </tr> <tr> <td>Project Files</td> <td>R1-28</td> <td>F. W. Ringe S1-54</td> </tr> <tr> <td>D. A. Conners, IV</td> <td>T6-10</td> <td>E. A. Smith L5-07</td> </tr> <tr> <td>L. L. Curfman [2]</td> <td>T6-12</td> <td>T. L. Sweet S4-01</td> </tr> <tr> <td>J. J. Dorian</td> <td>B2-16</td> <td>J. E. Witherspoon(PE)[2] R3-27</td> </tr> <tr> <td>J. K. Epperley</td> <td>R1-29</td> <td>DOE: M. S. Collins A5-18</td> </tr> <tr> <td>S. S. Glover</td> <td>R3-54</td> <td></td> </tr> <tr> <td>STA 6</td> <td>T2-Q3</td> <td></td> </tr> </table>	<u>KEH DISTRIBUTION</u>			Const Doc Cntl	E2-50	P. J. McKenna R3-54	<u>WHC DISTRIBUTION</u>		C. B. McVey T6-07	Central Files	L8-15	T. G. Montgomery T6-12	Engineering Files	A3-80	M. C. Prather L5-07	Project Files	R1-28	F. W. Ringe S1-54	D. A. Conners, IV	T6-10	E. A. Smith L5-07	L. L. Curfman [2]	T6-12	T. L. Sweet S4-01	J. J. Dorian	B2-16	J. E. Witherspoon(PE)[2] R3-27	J. K. Epperley	R1-29	DOE: M. S. Collins A5-18	S. S. Glover	R3-54		STA 6	T2-Q3		RELEASE STAMP <div style="border: 2px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p style="text-align: center;">OFFICIAL RELEASE BY WHC</p> <p style="text-align: center;">DATE MAR 16 1992</p> <p style="text-align: center;">STA 4</p> </div>
<u>KEH DISTRIBUTION</u>																																					
Const Doc Cntl	E2-50	P. J. McKenna R3-54																																			
<u>WHC DISTRIBUTION</u>		C. B. McVey T6-07																																			
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J. K. Epperley	R1-29	DOE: M. S. Collins A5-18																																			
S. S. Glover	R3-54																																				
STA 6	T2-Q3																																				

ENGINEERING CHANGE NOTICE

15. Design Verification Required

Yes
 No

16. Cost Impact

ENGINEERING

Additional \$ 200
Savings \$ _____

CONSTRUCTION

Additional \$ 250
Savings \$ _____

17. Schedule Impact (days)

Improvement _____
Delay N/A

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

<p>SDD/DD <input type="checkbox"/></p> <p>Functional Design Criteria <input type="checkbox"/></p> <p>Operating Specification <input type="checkbox"/></p> <p>Criticality Specification <input type="checkbox"/></p> <p>Conceptual Design Report <input type="checkbox"/></p> <p>Equipment Spec. <input type="checkbox"/></p> <p>Const. Spec. <input type="checkbox"/></p> <p>Procurement Spec. <input type="checkbox"/></p> <p>Vendor Information <input type="checkbox"/></p> <p>OM Manual <input type="checkbox"/></p> <p>FSAR/SAR <input type="checkbox"/></p> <p>Safety Equipment List <input type="checkbox"/></p> <p>Radiation Work Permit <input type="checkbox"/></p> <p>Environmental Impact Statement <input type="checkbox"/></p> <p>Environmental Report <input type="checkbox"/></p> <p>Environmental Permit <input type="checkbox"/></p>	<p>Seismic/Stress Analysis <input type="checkbox"/></p> <p>Stress/Design Report <input type="checkbox"/></p> <p>Interface Control Drawing <input type="checkbox"/></p> <p>Calibration Procedure <input type="checkbox"/></p> <p>Installation Procedure <input type="checkbox"/></p> <p>Maintenance Procedure <input type="checkbox"/></p> <p>Engineering Procedure <input type="checkbox"/></p> <p>Operating Instruction <input type="checkbox"/></p> <p>Operating Procedure <input type="checkbox"/></p> <p>Operational Safety Requirement <input type="checkbox"/></p> <p>IEFD Drawing <input type="checkbox"/></p> <p>Cell Arrangement Drawing <input type="checkbox"/></p> <p>Essential Material Specification <input type="checkbox"/></p> <p>Fac. Proc. Samp. Schedule <input type="checkbox"/></p> <p>Inspection Plan <input type="checkbox"/></p> <p>Inventory Adjustment Request <input type="checkbox"/></p>	<p>Tank Calibration Manual <input type="checkbox"/></p> <p>Health Physics Procedure <input type="checkbox"/></p> <p>Spares Multiple Unit Listing <input type="checkbox"/></p> <p>Test Procedures/Specification <input type="checkbox"/></p> <p>Component Index <input type="checkbox"/></p> <p>ASME Coded Item <input type="checkbox"/></p> <p>Human Factor Consideration <input type="checkbox"/></p> <p>Computer Software <input type="checkbox"/></p> <p>Electric Circuit Schedule <input type="checkbox"/></p> <p>ICRS Procedure <input type="checkbox"/></p> <p>Process Control Manual/Plan <input type="checkbox"/></p> <p>Process Flow Chart <input type="checkbox"/></p> <p>Purchase Requisition <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p>
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19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision Document Number/Revision Document Number/Revision

20. Approvals

	Signature	Date		Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT-ENGINEER		
Cog./Project Engineer	<u>[Signature]</u>	<u>3/12/92</u>	RE	<u>[Signature]</u>	<u>3-10-92</u>
Cog./Project Engr. Mgr.	<u>[Signature]</u>	<u>3/13/92</u>	QA	<u>[Signature]</u>	<u>3/9/92</u>
QA	<u>[Signature]</u> J. Van Beck	<u>3/13/92</u>	Safety	<u>[Signature]</u>	<u>3-9-92</u>
Safety	<u>[Signature]</u> Daniel A. Comer	<u>3/12/92</u>	Design	<u>[Signature]</u>	<u>3-9-92</u>
Security	_____	_____	Other	<u>N/A</u>	_____
Proj. Prog./Dept. Mgr.	_____	_____	ENV	<u>[Signature]</u>	<u>3-9-92</u>
Def. React. Div.	_____	_____	PIE	<u>[Signature]</u>	<u>3-10-92</u>
Chem. Proc. Div.	_____	_____		_____	_____
Def. Wst. Mgmt. Div.	_____	_____	DEPARTMENT OF ENERGY		
Adv. React. Dev. Div.	_____	_____		_____	_____
Proj. Dept.	_____	_____	ADDITIONAL		
Environ. Div.	_____	_____		_____	_____
IRM Dept.	_____	_____		_____	_____
Facility Rep. (Ops)	<u>[Signature]</u>	<u>3/11/92</u>		_____	_____
Other	_____	_____		_____	_____

Specification W-011H-C1, Section 02745

ECN No. W-011-33	Page 3 of 3	
Ref. Dwg. SPEC W-011H-C1	Sh. _____	Rev. 1
Prep. By D.L. FORT	Ckd. By <i>[Signature]</i>	

Revise paragraph 1.2.3 to read as follows:

1.2.3 Septic Tank Plans: Submit plans showing dimensions, reinforcing, and structural calculations including certification of tank capacity and structural capacity. For precast concrete or fiberglass tanks, submit manufacturers certification that the septic tank design is approved by the Washington State Department of Health and include manufacturer's installation procedures.

Revise paragraph 2.1.7 to read as follows:

2.1.7 PVC Fittings: Meeting the requirements of ASTM D 2466 for pressurized applications and ASTM D 3034 for gravity flow piping unless noted otherwise on the drawings.

Revise paragraph 2.2.1 to read as follows:

(Modifies ECN W-011-28, item 8)

2.2.1 Septic Tanks: Minimum 2 compartments with minimum fluid capacity of 10,000 gallons. Inlet compartment at least 2/3 total tank capacity. Tank shall meet the requirements of UPC, Appendix I, be either precast or cast in place concrete or fiberglass designed to withstand HS 20-44 load criteria given in AASHTO Figures 3.7.6B and 3.7.7A, and constructed in accordance with UPC, Appendix I, Section 15. Provide adequate access opening in the septic tank for the maintenance of the effluent filters, (see paragraph 2.2.5). Minimum access opening shall be 24 inches inside diameter. Provide risers to 6 inches above finished grade and sized equal to or slightly larger than the tank access openings. Riser shall be provided with a cover fabricated from 1/4 inch steel plate or other similar stout material.

Revise paragraph 3.1.2 to read as follows:

(Modifies ECN W-011-28, item 9)

3.1.2 Install septic tank and effluent filter assembly in accordance with approved submittals, manufacturers recommendations, and UPC, Appendix I, Section 15. Finish grade above septic tank may be recessed from surrounding grade to minimize access riser depth. Provide a level access area above the septic tank of minimum 30 feet by 50 feet with side slopes to grade of minimum 5 to 1.



EXPIRES: 10/11/93

ENGINEERING CHANGE NOTICE

Page 1 of 3

1. ECN ~~166264~~
 Proj. ECN W-011-30

2. ECN Category (mark one)	Supplemental <input checked="" type="checkbox"/>	Change ECN <input type="checkbox"/>	Supersedure <input type="checkbox"/>
Cancel/Void <input type="checkbox"/>	Direct Revision <input type="checkbox"/>	Temporary <input type="checkbox"/>	Discovery <input type="checkbox"/>

3. Originator's Name, Organization, MSIN, and Telephone No. Eric Pennala KEH, CM 373-2275	4. Date 2-14-92
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5. Project Title/No./Work Order No. Waste Sampling and Characterization Facility/CR9396/Sitework (W-011H)	6. Bldg./Sys./Fac. No. 6266	7. Impact Level 3/SC3
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8. Document Number Affected (include rev. and sheet no.) W-011H-C1 Rev 1 See Block 12	9. Related ECN No(s). N/A	10. Related PO No. N/A
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11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input type="checkbox"/> No (NA Blks. 11b, 11c, 11d) <input checked="" type="checkbox"/> Unknown	11b. Work Package Doc. No. Unknown	11c. Complete Installation Work N/A <hr/> Cog. Engineer Signature & Date	11d. Complete Restoration (Temp. ECN only) N/A <hr/> Cog. Engineer Signature & Date
---	---	--	---

12. Description of Change W-011H-C1 REV 1 H-6-1675 SHT 1 REV 1 SC-3

1. Specification Section 02650, Part 2 - Products.
 - a.) Add to last sentence of paragraph 2.1.4.1 - "OR MUELLER."
 - b.) Add to last sentence of paragraph 2.1.5. - "OR MUELLER."
 - c.) Add to last sentence of paragraph 2.1.6 - "OR MUELLER."
2. Specification Section 02650, Part 3 - EXECUTION
 - a.) Revise paragraph 3.1.12.2 to read:

 "After installation and testing, flush piping with water until effluent is clean and contains no visible particulate matter but in no case for less than one minute."

13a. Justification (mark one)	Criteria Change <input type="checkbox"/>	Environmental <input type="checkbox"/>	Facilitate Const. <input checked="" type="checkbox"/>
Design Error/Omission <input type="checkbox"/>	Design Improvement <input type="checkbox"/>	As-Found <input checked="" type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>

13b. Justification Details

- 1.) Substitution of equal products
- 2.) Eliminating safety concern of having open trenches for extended period of time before pressure test of sanitary water lines.
- 3.) Add additional criteria to qualify concrete mix design
- 4.) Existing cross has leaded connections in lieu of flanged as noted on dwg.

14. Distribution (include name, MSIN, and no. of copies) <table style="width: 100%;"> <tr> <td style="width: 30%;">KEH DISTRIBUTION</td> <td style="width: 30%;">A. V. Lincoln S2-62</td> <td style="width: 40%;"></td> </tr> <tr> <td>Const Doc Cntl E2-50</td> <td>P. J. McKenna R3-54</td> <td></td> </tr> <tr> <td>WHC DISTRIBUTION</td> <td>C. B. McVey T6-07</td> <td></td> </tr> <tr> <td>Central Files L8-15</td> <td>T. G. Montgomery T6-12</td> <td></td> </tr> <tr> <td>Engineering Files A3-80</td> <td>M. C. Prather L5-07</td> <td></td> </tr> <tr> <td>Project Files R1-28</td> <td>F. W. Ringe S1-54</td> <td></td> </tr> <tr> <td>D. A. Conners, IV T6-10</td> <td>E. A. Smith L5-07</td> <td></td> </tr> <tr> <td>L. L. Curfman [2] T6-12</td> <td>T. L. Sweet S4-01</td> <td></td> </tr> </table>	KEH DISTRIBUTION	A. V. Lincoln S2-62		Const Doc Cntl E2-50	P. J. McKenna R3-54		WHC DISTRIBUTION	C. B. McVey T6-07		Central Files L8-15	T. G. Montgomery T6-12		Engineering Files A3-80	M. C. Prather L5-07		Project Files R1-28	F. W. Ringe S1-54		D. A. Conners, IV T6-10	E. A. Smith L5-07		L. L. Curfman [2] T6-12	T. L. Sweet S4-01		RELEASE STAMP OFFICIAL RELEASE 13 BY WHC DATE FEB 20 1992 STA 4
KEH DISTRIBUTION	A. V. Lincoln S2-62																								
Const Doc Cntl E2-50	P. J. McKenna R3-54																								
WHC DISTRIBUTION	C. B. McVey T6-07																								
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D. A. Conners, IV T6-10	E. A. Smith L5-07																								
L. L. Curfman [2] T6-12	T. L. Sweet S4-01																								

A-7900-013-2 (11/88) (EF) GEF095 Engineering Change Notice J. J. Dorian B2-16 J. K. Epperley R1-29 S. S. Glover R3-54	J. E. Witherspoon(PE)[2] R3-27 DOE:M. S. Collins A5-18	STA 10 STA 6 WPC GARZA A3-87 T2-03 A3-80
---	---	---

ENGINEERING CHANGE NOTICE

Page 2 of 3

1. ECN (use no. from pg. 1)
W-011H-30

15. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	16. Cost Impact <table style="width: 100%;"> <tr> <td style="width: 50%; text-align: center;">ENGINEERING</td> <td style="width: 50%; text-align: center;">CONSTRUCTION</td> </tr> <tr> <td>Additional <input checked="" type="checkbox"/> \$700</td> <td>Additional <input checked="" type="checkbox"/> \$6500</td> </tr> <tr> <td>Savings <input type="checkbox"/> \$</td> <td>Savings <input type="checkbox"/> \$</td> </tr> </table>	ENGINEERING	CONSTRUCTION	Additional <input checked="" type="checkbox"/> \$700	Additional <input checked="" type="checkbox"/> \$6500	Savings <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$	17. Schedule Impact (days) Improvement <input type="checkbox"/> 5 Delay <input checked="" type="checkbox"/> days
ENGINEERING	CONSTRUCTION							
Additional <input checked="" type="checkbox"/> \$700	Additional <input checked="" type="checkbox"/> \$6500							
Savings <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$							

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD <input type="checkbox"/>	Seismic/Stress Analysis <input type="checkbox"/>	Tank Calibration Manual <input type="checkbox"/>
Functional Design Criteria <input type="checkbox"/>	Stress/Design Report <input type="checkbox"/>	Health Physics Procedure <input type="checkbox"/>
Operating Specification <input type="checkbox"/>	Interface Control Drawing <input type="checkbox"/>	Spares Multiple Unit Listing <input type="checkbox"/>
Criticality Specification <input type="checkbox"/>	Calibration Procedure <input type="checkbox"/>	Test Procedures/Specification <input type="checkbox"/>
Conceptual Design Report <input type="checkbox"/>	Installation Procedure <input type="checkbox"/>	Component Index <input type="checkbox"/>
Equipment Spec. <input type="checkbox"/>	Maintenance Procedure <input type="checkbox"/>	ASME Coded Item <input type="checkbox"/>
Const. Spec. <input type="checkbox"/>	Engineering Procedure <input type="checkbox"/>	Human Factor Consideration <input type="checkbox"/>
Procurement Spec. <input type="checkbox"/>	Operating Instruction <input type="checkbox"/>	Computer Software <input type="checkbox"/>
Vendor Information <input type="checkbox"/>	Operating Procedure <input type="checkbox"/>	Electric Circuit Schedule <input type="checkbox"/>
OM Manual <input type="checkbox"/>	Operational Safety Requirement <input type="checkbox"/>	ICRS Procedure <input type="checkbox"/>
FSAR/SAR <input type="checkbox"/>	IEFD Drawing <input type="checkbox"/>	Process Control Manual/Plan <input type="checkbox"/>
Safety Equipment List <input type="checkbox"/>	Cell Arrangement Drawing <input type="checkbox"/>	Process Flow Chart <input type="checkbox"/>
Radiation Work Permit <input type="checkbox"/>	Essential Material Specification <input type="checkbox"/>	Purchase Requisition <input type="checkbox"/>
Environmental Impact Statement <input type="checkbox"/>	Fac. Proc. Samp. Schedule <input type="checkbox"/>	
Environmental Report <input type="checkbox"/>	Inspection Plan <input type="checkbox"/>	
Environmental Permit <input type="checkbox"/>	Inventory Adjustment Request <input type="checkbox"/>	

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER <i>RM for JMF</i>	2-20-92
Cog./Project Engineer <i>[Signature]</i>	2/20/92	PE <i>[Signature]</i>	2-19-92
Cog./Project Engr. Mgr. <i>[Signature]</i>	2/20/92	QA <i>[Signature]</i>	2-20-92
QA <i>[Signature]</i>	2/2/92	Safety <i>[Signature]</i>	2-20-92
Safety <i>[Signature]</i>	2/20/92	Design <i>[Signature]</i>	2/19/92
Security <i>[Signature]</i>		Other ENV. <i>[Signature]</i>	2/20/92
Proj. Prog./Dept. Mgr.			
Def. React. Div.			
Chem. Proc. Div.			
Def. Wst. Mgmt. Div.			
Adv. React. Dev. Div.			
Proj. Dept.			
Environ. Div.			
IRM Dept.			
Facility Rep. (Ops.) <i>[Signature]</i>	2/20/92		
Other <i>WMC S&WU.</i>			

DEPARTMENT OF ENERGY

ADDITIONAL

BLOCK 12. DESCRIPTION OF CHANGE continued,

b.) Revise paragraph 3.2.1.4 to read:

"Perform tests in accordance with approved procedure."

3.) Specification Section 03300, Part 2- PRODUCTS

Revise Paragraph 2.1.1.4.d as follows:

Proportions: In accordance with ACI 301, Sections 3.8, 3.9 and/or 3.10

4.) Drawing H-6-1675, Rev. 1

Zone C8 - Revise STA (-) 0 + 05 note to read:

Begin SW line tie-in to existing 8" service as follows:

a) Remove existing 8" leaded cross.

b) Install 8" all flanged tee, 8" flanged by plain end spool, and 8" mechanical joint sleeves with set screw retainer gland.

DISTRIBUTION SHEET

To: Project W-011H Participants From: Grout and Laboratory Projects Date: 11/8/91

Project Title/Work Order:

Waste Sampling and Characterization Facility

EDT No.:

ECN No.: W-011-22

Name	MSIN	With Attachment	EDT/ECN & Comment	EDT/ECN Only
H. M. Bucci	L6-30	1		
S. L. Brey	T6-12	1		
D. A. Conners, IV	T6-10	1		
L. L. Curfman	T6-12	1		
J. J. Dorian	B2-16	1		
A. V. Lincoln	S2-62	1		
T. L. Sweet	S4-01	1		
M. S. Collins	A5-18	1		
J. E. Van Beek	R3-27			x
J. E. Witherspoon	R3-27	2		
Project Files	R1-28	1		
J. M. Frank	E6-20	1		
E. Pennala CONST. DOC. CTRL	E2-30	6		
ENG. DOC. CTRL	E6-24	2		
WAC. DOCUMENT PROCESSING	LB-15	2		

RECORD OF REVISION

(1) Document Number

W-011H-C1

Page

41

(2) Title

Construction Specification for Sitework for Waste Sampling and Characterization Facility

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release		
		(5) Cog./Proj. Engr.	(6) Cog./Proj. Mgr.	Date
RS 1	(7) EDT-125972 - REV. 0 Direct revision per ECNs W-011-4; W-011-5; W-011H-6; W-011H-7; W-011-10; W-011-11; W-011-12; W-011H-17; and W-011-22	<i>[Signature]</i>	<i>[Signature]</i>	11/27/91

CONSTRUCTION SPECIFICATION FOR
SITEWORK
WASTE SAMPLING AND CHARACTERIZATION FACILITY

Prepared By:

KAISER ENGINEERS HANFORD COMPANY
Richland, Washington

CERTIFICATIONS

I am responsible for the following Specification Sections:

02200
02730
02745
02935



EXPIRES: 10/11/93

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Section 16400	Service and Distribution	11	
APPENDIX A	Electrical Temporary Power One Line, Schedule and Details		

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 INTRODUCTION

1.1.1 Project W-011H for construction of Waste Sampling and Characterization Facility is located in the 600 Controlled Access Area of the Hanford Site, just outside the 200 West Area, approximately 25 road miles northwest of Richland, Washington.

1.1.2 This Specification is for construction of portion of facility.

1.2 STATEMENT OF WORK

1.2.1 Scope: Work consists of furnishing labor, equipment, and materials to provide ready for occupancy site in accordance with the Contract Documents.

1.2.2 Work Included: Following itemization is intended to be broad in scope to identify major work elements and is not all inclusive.

1.2.2.1 Level and provide 4 inch gravel base course on service yard.

1.2.2.2 Furnish, install, and test contaminated liquid waste drain system.

1.2.2.3 Construct retention vault.

1.2.2.4 Furnish, install, flush, test, and sanitize sanitary and fire water system, including tie-in to existing lines inside 200 West Limited Area. Include thrust blocks, PIV valves, fire hydrants, and miscellaneous lateral connections.

1.2.2.5 Construct drainfield and pressurized sanitary sewer system, including power pole, transformers and power lines to pumping units.

1.2.2.6 Clear and grub vegetation within facility site boundary from N42000 to N42675 and W68750 to W69340. Finish grade and level as shown on the Drawings.

1.2.2.7 Furnish and install overhead and underground power lines, including 4 poles from existing 13.8 kV lines west of Project. Tie-in will be accomplished by others.

1.2.2.8 Furnish and install electrical Manhole No. 1. Construct electrical ductbanks from last aerial pole to electrical Manhole No. 1.

1.2.2.9 Furnish and install concrete vault. Construct electrical ductbank from Manhole No. 1 to concrete vault for temporary construction power.

1.2.2.10 Furnish and install telecommunication Manhole No. 1, construct telecommunications ductbank from last aerial pole to telecommunication Manhole No. 1.

1.2.2.11 Furnish and install Schedule 80, 4 inch PVC from telecommunications Manhole No. 1 to area near transformer pad/vault.

1.2.2.12 Furnish and install handhole. Install Schedule 80, 4 inch PVC from area of future pedestal to handhole.

1.2.2.13 Furnish and install concrete pad/vault for transformer and install electrical power panel for construction power.

1.2.2.14 Pull wire from last power pole to construction power pad. Set and tie-in KEH furnished pad mounted 300 kVA and 60 kVA transformers. Tie-in power panel to transformer. Test electrical system.

1.2.2.15 Repair asphaltic concrete roadway surfaces after underground work, including septic system, is completed.

1.2.2.16 Install ductbank from point on main ductbank route perpendicular up to a pedestal near 6265A Building.

1.2.2.17 Furnish and install pump, motor, and controls including starters for lift station.

1.2.3 Work Not Included

1.2.3.1 Fuses for electric power transmission fused cutout are part of Project, but will be furnished and installed by Operating Contractor.

1.2.3.2 Following items of work will be accomplished by other work packages.

a. Project fence.

b. Access and service roads.

1.3 SEQUENCE OF WORK

1.3.1 Work shall be accomplished in a sequence to minimize the effects of winter weather during construction operations.

1.3.1.1 Deleted.

1.3.1.2 Deleted.

1.3.1.3 Deleted.

1.4 DRAWINGS

1.4.1 Drawings which show work to be accomplished by the Contract Documents are listed in the Schedule of Drawings.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01019

ITEMS FURNISHED FOR CONSTRUCTION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Code of Federal Regulations (CFR)

Title 30, Mineral Resources
Chapter I, Mine Safety and Health Administration,
Department of Labor
Subchapter N, Metal and Nonmetal Mine Safety and Health

Part 56, Safety and Health Standards -- Surface Metal and
Nonmetal Mines

1.2 SUBMITTALS: Not Used

1.3 GENERAL

1.3.1 Material and equipment furnished or made available for incorporation into the Work are set forth in this Section. Other services and utilities provided are covered in other sections of this Specification.

1.3.2 Meet the provisions of Section 9 of the Contract General Conditions for items furnished for construction.

1.3.3 Provide KEH access to premises where items furnished for construction are stored before incorporation into the Work.

1.4 MATERIAL AND EQUIPMENT

1.4.1 Gravel and Sand

1.4.1.1 Unmined natural deposits are available at no cost from sites designated by KEH within 10 miles of Project site. KEH makes no representation that materials will meet physical properties required in this Specification.

1.4.1.2 If Contractor elects to utilize available gravel sites he shall furnish equipment and labor required to excavate, process, load, transport, and place material.

1.4.1.3 Material shall be used only for the Work covered by this Specification and no gravel or sand, processed or unprocessed, or concrete manufactured therefrom shall be transported off the Hanford Site.

1.4.1.4 Access to gravel sites and travel between gravel and construction sites shall be on roads designated by KEH and use shall be in accordance with Section 01500.

1.4.1.5 Operations of gravel sites shall meet the following requirements.

a. Confine removal of overburden and top soil to areas designated by KEH. Stabilize blow sand areas after surface has been disturbed, with ballast or other approved method to prevent wind erosion.

b. Make no excavation or bank cut within 100 feet of power lines, paved roads, railroads, security fences, or other permanent structures.

c. Excavating and processing shall be in accordance with CFR Title 30, Chapter I, Subchapter N, Part 56. Correct operations identified by KEH to be hazardous to life or property.

d. Explosives are prohibited articles described in Section 56 of the Contract General Conditions and shall not be brought to the Hanford Site or proposed for use without written KEH approval.

e. Temporary structures are permitted at gravel site for offices, storage or repair facilities necessary for gravel removal and processing. No facility for habitation will be permitted.

f. Use of gravel sites are nonexclusive. Others may also enter to excavate material required for other work.

g. Upon completion of operations clear gravel site of debris, temporary structures, and equipment. Grade excavated area, properly slope banks, and stabilize to prevent wind erosion. Conditions identified by KEH as not meeting these requirements shall be corrected before final acceptance of the Work.

h. Right to use gravel sites may be terminated by KEH for failure to meet the requirements set forth or for abandonment of operations under this Contract. Right to use gravel will terminate without notice upon acceptance of Work under this Contract.

1.4.2 Items listed below will be furnished by KEH for incorporation into the Work.

1.4.2.1 300 kVA and 60 kVA, 3-phase, pad mounted transformers, and temporary power panel.

1.4.3 Item noted in subparagraph 1.4.2.1 is on hand and presently stored in 200 East Area approximately 3 miles from Project site. Notify KEH 2 working days before need date to arrange for pick-up.

1.4.4 Furnish other items, shown on the Drawings or specified, required to complete the Work.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01027

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 FORMAT

1.3.1 Complete Form KEH-1026.00, Progress Estimate Backup, sample appended. Contractor developed substitutes for form may be used with prior approval of KEH.

1.3.2 Complete Form KEH-0959.00, Monthly Estimate of Work Completed, sample appended, or include following in letter requesting payment.

Subtotal Value of All Pay Items		\$X,XXX.XX
Complete to date (Include modifications)		
Allowance for Material Stored on Site:		
Previous Net Allowance	\$X,XXX.XX	
Minus Materials Placed	\$X,XXX.XX	
Plus Materials Stored	<u>\$X,XXX.XX</u>	
Net Allowance		<u>\$X,XXX.XX</u>
Subtotal Value Completed to Date		\$X,XXX.XX
Less Previous Payments	\$X,XXX.XX	
Less Other Charges from KEH	<u>\$X,XXX.XX</u>	
Subtotal Deductions		<u>\$X,XXX.XX</u>
Total Payment Requested		\$X,XXX.XX
Less Retainage at ___%		<u>\$X,XXX.XX</u>
Total Payment Allowed		\$X,XXX.XX

1.4 APPLICATION PROCEDURE

1.4.1 Payments to Contractor specified in Section 15 of Contract General Conditions are initiated by Contractor making application as follows.

1.4.1.1 Begin application by completing Form KEH-1026.00. For lump sum contracts, each application shall include, as minimum, breakdown of Contract price for items listed in Section 01310 and percent complete for each item.

1.4.1.2 Review information with KEH approximately 5 days before end of pay period, adjust data, if required, initial, and return to KEH.

1.4.1.3 Finalize application by meeting requirements of Paragraph 1.3.2.

1.5 PAYMENT PROCEDURE

1.5.1 Upon receipt of application, KEH will audit data and check for compliance with requirements of Section 01720. When satisfied that Contract requirements are up-to-date, Form KEH-0959.00 will be signed by KEH.

1.5.2 Copy of signed Form KEH-0959.00 showing amount of payment to be made will be furnished to contractor.

1.5.3 KEH will mail check to Contractor's designated address.

1.6 ADDITIONAL DATA REQUIRED

1.6.1 When processing applications for payment and preparing payment documents, KEH may require data to substantiate and justify amounts requested. Processing of payment documents may be delayed if data is not forwarded expeditiously to KEH.

1.6.2 Requests for payment for equipment or material which Contractor has received, but has not installed, shall be accompanied by invoice or other data to provide evidence that title to equipment or material is held by Contractor.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

Contract or P.O. No.

Estimate No.

Date

Name of Contractor

Address

Nature of Work

Initial Amount of Contract

Total Amount of Modifications to Date

Total Adjusted Contract Amount

\$

\$

\$

Description

Amount

Estimated Work Completed to (Date)

Less:

Previous Payments

\$

Other Charges
(Explain Below)

\$

Total Deductions

(\$

)

Adjusted Payment Requested

\$

Less Retainage @ _____ %

\$

Total Payment Allowed

\$

I certify that I have verified this periodical estimate dated _____ for \$ _____ and that to the best of my knowledge and belief it is a true and correct statement of work performed and that the contractor's statement of his account and amount due him is correct and just, and the quantities included in this estimate have been performed in full accordance with the terms and conditions of the corresponding construction documents.

FOR THE CONTRACTOR

KAISER ENGINEERS HANFORD COMPANY

By _____

By _____

SECTION 01040

COORDINATION

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 CONSTRUCTION ACTIVITIES

1.3.1 Coordinate construction activities to ensure efficient and orderly sequence of work, with provisions for accommodating items to be installed later.

1.3.2 As noted in Section 29 of the Contract General Conditions, other contracts may be under construction concurrently with the Work included in this Specification. Coordinate activities with other contractors for mutual benefit. Coordination meetings may be required in addition to progress meetings to keep parties informed of scheduled activities at interface points.

1.4 CONNECTIONS TO EXISTING SYSTEMS

1.4.1 Advance notice of work that will affect existing systems shall be given to KEH. Careful planning and scheduling of work is required to coordinate operations of existing systems to keep disruptions at minimum.

1.4.2 As required in subsection 50.8 of the Contract General Conditions, connections to existing systems shall be scheduled well in advance for work to be done. KEH will coordinate schedule with Contractor and utility system operators.

1.4.3 Connection shall be accomplished within 4 hours.

1.5 ACCESS TO WORK AFTER POSSESSION

1.5.1 Access to warranty work as specified in Section 24 of the Contract General Conditions or access to work after possession as specified in Section 20 of the Contract General Conditions will be coordinated by KEH with other contractors, and users of facility. Notify KEH in advance of proposed work to minimize disruptions.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01043

JOB SITE ADMINISTRATION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 National Fire Protection Association (NFPA)

NFPA 10 Standard for Portable Fire Extinguishers, 1988 Edition

1.1.1.2 American National Standards Institute (ANSI)

ANSI Z41-1983 Personal Protection-Protective Footwear

ANSI Z87.1-1989 Practice for Occupational and Educational Eye and Face Protection

1.2 SUBMITTALS: Not Used

1.3 WORKING HOURS

1.3.1 Regular day shift working hours are from 7:30 am to 4:00 pm, Monday through Friday, excluding holidays.

1.3.2 For other than regular day shift work refer to Section 51 of Contract General Conditions.

1.4 BADGE, DOSIMETER, AND ORIENTATION

1.4.1 Majority of work being within Controlled Access Area with some inside Limited Area badge, basic dosimeter requirements, and orientation will be in accordance with Section 56 of Contract General Conditions.

1.4.2 Badges will not be provided until Notice to Proceed letter has been signed and returned to KEH, supervisors have attended KEH safety training course, requirements of Section 55 of Contract General Conditions have been received and approved by KEH, and site labor conference and preconstruction meeting, specified in Section 01200, have been completed.

1.5 EMERGENCY RESPONSE DRILLS

1.5.1 Personnel working on Hanford Site shall participate in emergency response drills held approximately once every 3 months and last approximately one hour.

1.5.2 Maintain daily log or other suitable record of personnel names, including subcontractors, working on Hanford Site.

1.6 SECURITY

1.6.1 Policy and Procedures: Contractor employees shall meet with security policies and procedures specified in Sections 56 and 87 of Contract General Conditions. Copies of KEH Security Procedures will be provided upon request after award of Contract.

1.6.2 Security Escorts

1.6.2.1 Personnel not having "5" or "3" security clearance, working within 200 West Limited Area require security escorts. Escorts are provided by KEH at no cost except as set forth in subparagraph 1.6.2.4.

1.6.2.2 Provide list of employees and vehicles to be used inside Limited Area, and anticipated start and duration of utilization. Provide list one week before start of work in Limited Area for escort requirement determination. Provide weekly work schedules of employees, no later than Thursday of preceding week, minimum 24 hour notice required for change, for KEH to provide sufficient escorts.

1.6.2.3 Escorts will be assigned from KEH trailer located outside 200-East Limited Area near Access Gate No. 814. Personnel shall meet and transport assigned escorts from that location. Provide space within vehicles to accommodate number of escorts required. Minimum one escort is required in each vehicle.

1.6.2.4 Contractor may be charged for escorts when escorts have been requested and Contractor personnel do not show up at time and place specified. Charges will be made at rate of \$23 per hour for each escort for time lost waiting.

1.6.3 Security Clearances: Security clearances for Contractor employees may be provided for this Work and reduce requirements for security escorts during construction. Requests for "5" clearance will be considered under following circumstances.

1.6.3.1 Contractor has contract with KEH for work within Limited Area and has minimum 60 calendar days of onsite work remaining when request for clearance is received.

1.6.3.2 Clearances requested are for full-time employees, including crafts, expected to be employed for duration of Contract.

1.6.3.3 Personnel security questionnaire (PSQ) shall be completed for each person requesting clearance immediately after Contract award or as soon as onsite personnel requirements are known. PSQ forms available upon request.

1.6.3.4 Employees receiving security clearance are required to sign security termination form, furnished by KEH, and return form with security badge when their work is completed or Contract terminated.

1.7 WORK NEAR SECURITY FENCE

1.7.1 When effectiveness of fence is disturbed by excavating to depth of 6 inches or more under fence, a site security guard is required to standby. Notify KEH 2 working days before excavating under fence or performing work affecting fence as barrier. Plan work so physical integrity of fence is restored at end of each work day.

1.7.2 Site security guard is furnished by KEH at no cost to standby during regular day shift hours. If integrity of fence is not restored, Contractor will be charged \$50 per hour for each guard.

1.8 WORK NEAR OR ON ELECTRICAL LINES OR UTILITY POLES

1.8.1 In addition to requirements of subsection 50.2 of the Contract General Conditions, whenever work is performed under, adjacent to, or on overhead electrical lines or utility poles, notify KEH at least 3 working days before work commences. Notification shall include names and qualifications of personnel who will perform work and methods and equipment to be used. KEH will coordinate with the Site Utility Organization and notify the Contractor of special safety or operational requirements.

1.8.2 Some work will require that standby lineman be in attendance. Lineman will be furnished by KEH.

1.9 SAFETY REQUIREMENTS

1.9.1 Fire Safety

1.9.1.1 Address fire safety as part of construction safety program required by Section 55 of the Contract General Conditions. Incorporate following requirements into plan.

a. Utilizing portable shields wherever welding, cutting, or grinding.

b. Maintaining fire watch minimum 1/2 hour after welding, cutting, or grinding.

c. Having fully charged fire extinguisher, selected for specific class of hazard to be protected in accordance with NFPA 10, available whenever welding, cutting, or grinding.

d. Method to prevent ignition of brush fires.

1.9.1.2 See Section 01500 for off-road driving and grass fire prevention requirements.

1.9.2 Safety Apparel: All personnel are required to wear the following in recognized construction areas or when on business at KEH's shop or yards. Exception to these requirements for specific work tasks require approval from KEH in advance.

1.9.2.1 Steel-toed type shoes meeting the requirements of ANSI Z41. Shoes shall be constructed of substantial material, preferably leather. Shoes shall be in good condition; damaged or exposed footwear is not acceptable. Tennis shoes, canvas type shoes, or other athletic type shoes, including those with steel toe protection, are not acceptable.

1.9.2.2 Approved eye protection with eye shield devices meeting the requirements of ANSI Z87.1.

1.9.2.3 Hardhats.

1.9.2.4 Appropriate clothing. Tank-top type shirts, sleeveless shirts, dresses or other than full length pants are not allowed in construction areas.

1.9.3 Job safety analysis required in subsection 55.2 of the Contract General Conditions shall address following work items as minimum.

1.9.3.1 Method to control brush fires.

1.9.3.2 Excavations.

1.9.3.3 Scaffolds.

1.9.3.4 Hazardous materials.

1.9.3.5 Shoring.

1.9.3.6 Welding or cutting.

1.9.3.7 Confined spaces.

1.9.3.8 Paint/coatings.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01050
FIELD ENGINEERING

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 QUALITY CONTROL

1.3.1 Establishing alignment, support location, and grades shall be the responsibility of a Land Surveyor registered in the State of Washington and acceptable to KEH.

1.3.2 Deliver field notes, records, and documentation to KEH to review and verify procedures used and accuracy of work.

1.4 SURVEY DATA

1.4.1 Basic reference points with coordinate descriptions and bench mark with elevation identified will be located in northwest, southeast, southwest, and northeast corners of Project site fencing.

1.4.2 Preserve bench marks and reference points, including stakes or other markers established until removal is authorized by KEH.

1.4.3 From information and dimensions shown on the Drawings, perform survey/layout required by the Work.

1.5 PROCEDURES

1.5.1 Before initial layout, field verify horizontal and vertical data. Report discrepancies to KEH.

1.5.2 Establish adequate permanent reference points to be used during construction, referenced to original control points. Record locations with horizontal and vertical data on project record documents.

1.5.3 Protect and preserve control and reference points, until Work is complete. Report loss or destruction of control points to KEH. Report relocation or change in data affecting reference points.

1.5.4 Periodically verify data for control and reference points, and construction stakes to maintain construction accuracy.

1.5.5 After completing and backfilling sanitary water, sanitary sewer, and contaminated liquid waste drain systems, place reference stakes every 100 feet for future location.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01065

PERMITS

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 FEDERAL, STATE, AND MUNICIPAL LAWS, CODES, AND REGULATIONS

1.3.1 Required permits or licenses to do business are responsibility of Contractor as specified in Section 6 of the Contract General Conditions.

1.4 HANFORD SITE PERMITS

1.4.1 General: Before certain types of work can be done at Hanford, Contractor is required to obtain a permit. Permits are provided by KEH at no cost, however, furnish information required and notify KEH in advance of work requiring permit. Meet the requirements and restrictions set forth in each permit. Keep permits posted in visible location at Site of work being performed.

1.4.2 Excavation: Do not excavate without permit specified in subsection 50.10 of the Contract General Conditions. Permit will be issued before start of construction and is for duration of the Work.

1.4.3 Backfill: Permit required for each element of fill and backfill and good for 5 days or duration of work element provided Work does not stop for 5 consecutive days. Complete permit form, furnished by KEH, and return to KEH for approval before starting work.

1.4.4 Tie-in: Separate permit required for each utility tie-in and is valid until tie-in is complete. Permits furnished by KEH with 5 days notice.

1.4.5 Hazardous Work Permit: Start no work without permit. Permit will provide personnel protection requirements and restrictions for work involving welding and cutting. Permit is good for duration of Contract.

1.4.6 Oversize Load: In addition to Washington State permit, obtain permits for each movement of each oversize vehicle or load within the Hanford Site. Permits will be furnished by KEH with 48 hour notice of width, height, and length of oversized load and proposed route of travel. Verify proposed route has been traveled and limitations have been identified. See Section 01500, subparagraph 1.6.3.2 for additional requirements.

1.4.7 Solid Waste Disposal Permit: Permit required for disposal of nonhazardous waste on the Hanford Site. See Section 01500, Paragraph 1.3.3, complete permit form, obtained from KEH, and return to KEH for approval prior to moving waste to the disposal site.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01100
SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Code of Federal Regulations (CFR)

Title 29, Labor
Subtitle B, Regulations Relating to Labor
Chapter XVII, Occupational Safety and Health Administration (OSHA)
Department of Labor
Part 1910, Occupational Safety and Health Standards

Subpart J General Environmental Controls

1910.147 The Control of Hazardous Energy
(Lockout/Tagout)

1.1.1.2 Federal Standards (FED STD)

FED-STD-313C Material Safety Data,
Transportation Data, And Disposal
Data For Hazardous Materials
Furnished To Government
Activities

1.1.1.3 Washington State Department of Ecology (WSDOE)

Chapter 173-303 WAC Dangerous Waste Regulations

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Hazardous Materials: Submit list of hazardous materials to be used. Include current Material Safety Data Sheet for each material.

1.2.2 Hazardous Material Storage: Submit proposed method for storage of materials.

1.2.3 Hazardous Waste: Submit physical descriptions of quantity of waste and waste containers to be generated.

1.2.4 Control of Hazardous Energy: Submit lockout/tagout procedures and training certifications for employees.

1.3 HAZARDOUS MATERIAL REQUIREMENTS

1.3.1 Hazardous products, defined in Section 111 of the contract General Conditions, whether specified, recommended, or voluntarily requisitioned by Contractor, shall be governed by requirements of FED-STD-313 and Section 111 of the Contract General Conditions.

1.4 DANGEROUS WASTE HANDLING REQUIREMENTS

1.4.1 Dangerous waste, defined in WSDOE Chapter 173-303 WAC, generated by Contractor at Project shall be turned over to KEH for disposal.

1.4.2 Contractor personnel who handle, transfer, accumulate, or otherwise work with dangerous waste shall be trained by KEH to the requirements of WSDOE Chapter 173-303-330.

1.4.3 Report dangerous waste or hazardous material spills to KEH immediately.

1.4.4 After identification of dangerous waste to be generated, a satellite accumulation area will be designated for Contractor to deposit waste.

1.4.5 Identify and package dangerous wastes as approved or directed by KEH.

1.5 CONFINED SPACE REQUIREMENTS

1.5.1 Develop work plan for confined space work on concrete retention vault and low lying areas where potential oxygen deficiencies may exist. Plan shall be part of Job Safety Analysis required in Section 55.2 of the Contract General Conditions.

1.5.2 Supply calibrated oxygen meter for use during construction of retention vault or other confined spaces.

1.6 CONTROL OF HAZARDOUS ENERGY

1.6.1 Meet lockout/tagout requirements of 29 CFR 1910.147. Requirements shall include, but are not limited to, following.

1.6.1.1 Establish energy control procedures and personnel training to ensure that before working on machines or equipment where unexpected energizing, startup, or release of stored energy could occur and cause injury, machines or equipment are isolated and rendered inoperative in accordance with 29 CFR 1910.147.

1.6.1.2 Certify that personnel training has been accomplished and is being kept up-to-date. Certification shall contain each employee's name and dates of training.

1.6.2 Coordinate with KEH on lockout/tagout procedures involving operations.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 PROCEDURES

1.3.1 Representatives from KEH and Contractor, including major subcontractors, shall participate in project conference and meetings. Representatives from Operating Contractor and DOE may attend as required by items to be discussed.

1.3.2 Meeting times and locations shall be mutually agreed to by Contractor and KEH and will be held at the Hanford Site in Richland, Washington. KEH will issue notices of meetings and prepare meeting minutes which will be distributed to project participants.

1.4 SITE LABOR CONFERENCE

1.4.1 Before starting construction onsite, conduct informational conference on Hanford Site labor requirements applicable to Project. KEH will provide meeting notice to representatives from labor organizations, identified by Contractor, whose members may be utilized in construction and are to attend conference. Contract shall present proposed work plan and craft utilization, and review Contract General Conditions relating to labor.

1.5 PRECONSTRUCTION

1.5.1 Meeting will be scheduled by KEH before start of onsite work. Authorized representatives of Contractor and major subcontractors shall attend and KEH will advise others having interest in Work. Meeting will be chaired by KEH.

1.5.2 Following items, as minimum, will be incorporated into agenda for meeting.

1.5.2.1 Point of contact and key personnel representing Operating Contractor, Safety, QA/QC, Acceptance Inspectors, and Construction Engineers.

1.5.2.2 Schedule requirements and restraints, submittals and work limitations.

1.5.2.3 Safety, construction progress meetings and frequency, and certified payrolls.

1.5.2.4 Report requirements and frequency.

1.5.2.5 Quality requirements.

1.5.2.6 Major material and equipment lists.

1.5.2.7 Other pertinent items.

1.6 CONSTRUCTION PROGRESS

1.6.1 Meetings held biweekly at time and location determined at preconstruction meeting will be approximately one hour long.

1.6.2 KEH will chair meeting and request attendance of key personnel required. Authorized representatives of Contractor and pertinent subcontractors shall attend.

1.6.3 Purpose of meetings is to monitor status and provide forum for exchange of pertinent information related to the Work. Major topics may include, but not be limited to, following.

1.6.3.1 Schedule, cost, and construction status.

1.6.3.2 Design and scope changes.

1.6.3.3 Submittal status, key material, and equipment delivery status.

1.6.3.4 Potential problem areas.

1.6.3.5 Inspection and testing status.

1.6.3.6 Action item status, goals for next meeting.

1.6.3.7 Other appropriate items.

1.6.4 Meeting minutes will be issued by KEH as promptly as possible following meeting. Action items will be identified with assigned follow-up. Issues resolved will be reported in minutes, as well as closed action items.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 This Section summarizes submittals required in Contract General Conditions and Part 1 of each section of this Specification. It explains type of submittals required, and describes procedures for submittals and review.

1.1.2 Submittals required are summarized in Article 1.3. Each submittal is identified by General Conditions and Specifications Section/Paragraph Number and Title. Submittals are required for either "Review and Approval" or "Review for Record".

1.1.2.1 Submittals requiring review and approval are to receive approval before procurement, fabrication, or construction is started.

1.1.2.2 Submittals requiring review for record are those on which procurement, fabrication, construction or acceptance testing may proceed, but acceptance is contingent upon compliance with Drawings and Specifications.

1.1.3 Supplemental Submittals are initiated by Contractor in accordance with Section 01630 for consideration of substitute products or corrective procedures and require review and approval.

1.2 SUBMITTAL PROCEDURES

1.2.1 Transmit submittals to KEH by Data Transmittal form.

1.2.2 Identify each submittal by Section/Paragraph Number and Title noted in Article 1.3. Number of copies required for retention by KEH are shown in Summary and include 2 copies to be returned to Contractor. Additional copies required for Contractor uses shall be added.

1.2.3 Review each submittal for completeness, compliance with Contract Documents, and proper identification before sending to KEH. Submittal data shall either be stamped showing review process has taken place or Data Transmittal form may be signed with statement of "Reviewed for Compliance." Submittals not stamped or signed to show review will be returned without consideration.

1.2.4 Submittals requiring review and approval will be stamped by KEH and marked "Approved", "Approved with Exception" or "Not Approved, Revise and Resubmit." Approval of submittals does not relieve Contractor of responsibility for errors contained therein.

1.2.4.1 Approved submittals are identified by submittal stamp with "Approved" or "Approved with Exception" box checked. "Approved" signifies

general concurrence to achieve conformance with design concept of Project and compliance with requirements of Contract Documents. "Approved with Exception" signifies general concurrence with noteworthy comments or clarifications. Approval of specific item shall not be construed as approval of system or assembly of which item is a component.

1.2.4.2 A submittal which is not approved is identified as "Not Approved, Revise and Resubmit." Submittal is considered by KEH to be technically deficient or incomplete and therefore, unacceptable. Resubmittal is required, hence fabrication, procurement, or performance of procedures shall not proceed.

1.2.4.3 Upon receipt of deficient submittal data, make corrections noted on transmittal and resubmit data to KEH within 10 calendar days.

1.2.5 Materials and equipment fabricated or installed without required approved submittals, or which differ from approved Drawings or vendor data are subject to rejection and replacement at Contractor's expense.

1.2.6 Delays arising from failure to submit, in timely manner, required Drawings, and other related data described in Contract Documents, shall not constitute excusable delays for extensions, unless excusable under other provisions of Contract. Allow 15 calendar days for KEH review and disposition of submittals, including shop drawings and vendor information, required to be furnished. Time period will be measured from date of receipt of submittal in KEH's office to date of return mailing.

1.2.7 Contractor is responsible for dimensions to be confirmed and correlated at Project site.

1.2.8 Submittals for review and record will be reviewed and filed. Incomplete or inaccurate data will be returned marked "Resubmit" with appropriate comments, and items procured or work performed shall be corrected. Payment for equipment will not be made unless required Vendor Information has been furnished.

1.2.9 Supplemental submittals shall contain sufficient data required in Section 01630 to show substantial compliance with Drawings and Specifications. Substitute product submittals shall contain as minimum, outline dimensions, operating clearances, and engineering data. Identify each submittal by Specification Section number and Paragraph number or referenced Drawing number and detail. Improperly identified or incomplete submittals will be returned without consideration.

1.2.10 Procedures for performing certain items of work are required to be submitted for review and approval before work is commenced. Those work procedures which have been approved by KEH for work similar to that to be accomplished on Project may not need to be reapproved. Forward one copy of previously approved procedure to KEH by Data Transmittal form and identify by Section/Paragraph Number, Title, and either procedure number or project number for which procedure was approved. Submittal will be reviewed by KEH

and if acceptable retained for record. If previously approved procedure is not acceptable submittal will be returned with requirements for resubmittal.

1.3 SUMMARY OF SUBMITTALS

General Conditions Section/Para. Number	Submittal Title	Quantity	Review and Approval	Review For Record
CONTRACT GENERAL CONDITIONS				
55.1	Certificates of First Aid Training (WISHA requirements)	2		Before badging
55.2	Safety Program and Job Safety Analysis. Include Confined Space Work Plan in Section 01100, Paragraph 1.5.1	5	5 days before start of work	
55.3	Industrial Injury/Illness Experience	5		5 days before start of work and each month
55.5.1	OSHA Form No. 200 Report	5		5th working day, each month
55.6	Equipment Certification	5		Before badging

Specifications Section/Para. Number	Submittal Title	Quantity	Review and Approval	Review For Record
SPECIAL PROJECT PROCEDURES				
01100/1.2.1	Hazardous Materials	5		5 days before material delivery
01100/1.2.2	Hazardous Materials Storage	5	5 days before material delivery	

Specifications Section/Para. Number	Submittal Title	Quantity	Review and Approval	Review For Record
SPECIAL PROJECT PROCEDURES (Continued)				
01100/1.2.3	Hazardous Waste	5		5 days before material delivery
01100/1.2.4	Control of Hazardous Energy	5	5 days before start of work	
PROGRESS SCHEDULES				
01310/1.2.1	Progress Schedule	5	10 days after notice of award	
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS				
01500/1.2.1	Anchoring and Enclosure Methods	5	Before placing field office	
01500/1.2.2	Traffic Control Plan	5	Before constructing crossing	
EARTHWORK				
02200/1.2.1	Method to Prevent Damage During Excavation	5	Before excavation	
PIPED UTILITIES				
02650/1.2.1	Approval Data	5	Before delivery	
02650/1.2.2	Vendor Information	12		Before installation
02650/1.2.3	Leak/Pressure Test Procedures	5	Before testing	
02650/1.2.4	NFPA Test Certificate	5	Within 10 days after completion	

Specifications Section/Para. Number	Submittal Title	Quantity	Review and Approval	Review For Record
PRESSURIZED SEPTIC SYSTEMS				
02745/1.2.1	Approval Data	5	Before delivery	
02745/1.2.2	Vendor Information	12		Before installation
02745/1.2.3	Septic Tank Plans	5	Before delivery	
02745/1.2.4	Dosing Tank Plans	5	Before delivery	
02745/1.2.5	Valve Vault Plans	5	Before delivery	
02745/1.2.6	Installer Certification	5		Before installation
02745/1.2.7	Method of Excavation	5	Before excavation	
02745/1.2.8	Filter Bed Media Lab Report	5		Before installation
CONTAMINATED LIQUID WASTE DRAIN SYSTEM				
02750/1.2.1	Vendor Information	12		Before installation
02750/1.2.2	Leak/Pressure Test Procedures	5	Before testing	
ELECTRIC POWER TRANSMISSION				
02785/1.2.1	Approval Data	5	Before delivery	
CAST-IN-PLACE CONCRETE				
03300/1.2.1	Certification of Ready Mixed Con- crete Production Facilities	5	Before mixing	
03300/1.2.2	Reinforcing Steel Fabricator Drawings	5	Before delivery	

Specifications Section/Para. Number	Submittal Title	Quantity	Review and Approval	Review For Record
CAST-IN-PLACE CONCRETE (Continued)				
03300/1.2.3	Block Diagram	5	Before installation of forms	
03300/1.2.4	Concrete Materials, Mix Design and Mix Proportions	5	Before mixing	
03300/1.2.5	Curing Procedure	5	Before mixing	
METAL FABRICATIONS				
05500/1.2.1	Fabricator Drawings	5	Before fabrication	
05500/1.2.2	Manufacturer's Data	5	Before delivery	
SPECIAL PROTECTIVE COATING				
09805/1.2.1	List of Materials	5	Before delivery	
PAINTING				
09900/1.2.1	List of Materials	5	Before delivery	
09900/1.2.2	Color Samples	3	Before delivery	
MEDIUM VOLTAGE DISTRIBUTION				
16300/1.2.1	Approval Data	5	Before delivery	
16300/1.2.2	Vendor Information	12		Before installation

Specifications Section/Para. Number	Submittal Title	Quantity	Review and Approval	Review For Record
SERVICE AND DISTRIBUTION				
16400/1.2.1	Approval Data	5	Before delivery	
16400/1.2.2	Vendor Information	12		Before installation
16400/1.2.3	Seismic Design	5	Before installation	

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01310
PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Progress Schedules: Submit following schedules required in Article 1.3.

1.3 PROGRESS SCHEDULES

1.3.1 Schedules identified in Section 5 of the Contract General Conditions shall be in accordance with following.

1.3.1.1 Show order Contractor proposes to carry on the Work, starting dates of the several salient features of the Work including procurement of materials and equipment, and contemplated dates for completion. Each schedule shall be in form of bar chart of suitable scale to show percentage of Work scheduled for completion at any time with separate bar for each activity. At end of each week or at end of other periods of time specified in Contract, prepare and submit one copy of chart showing actual progress at end of period.

1.3.2 Organize schedule to show activities relative to each major subcontractor and supplier. Provide subschedule to define critical portions of entire schedule.

1.3.3 Schedule shall include design activities and milestones, delivery date of design documents, construction activities, progress milestones, and include, but not be limited to, following activities.

1.3.3.1 Bond and insurance.

1.3.3.2 Submittal schedule.

1.3.3.3 Mobilization.

1.3.3.4 Survey.

1.3.3.5 Clearing.

1.3.3.6 Earthwork.

1.3.3.7 Install sanitary water lines, including tie-in.

1.3.3.8 Install chemical drain system, including retention vault.

1.3.3.9 Install power poles and line work.

- 1.3.3.10 Install electrical conduit and ductbanks.
- 1.3.3.11 Install electrical wiring and KEH furnished transformer.
- 1.3.3.12 Install drainfield and pressurized septic system.
- 1.3.3.13 Deliver record documents and punchlist.
- 1.3.3.14 Demobilize.
- 1.3.4 Schedule shall show, as minimum, accumulated percentage of completion of each activity and total percentage of work completed as of last work day of each month.
 - 1.3.4.1 Develop an "S" curve from percentage of total work figures and superimpose on schedule.
 - 1.3.4.2 Show dollar value or percentage of total next to each activity shown on schedule. Figures will be basis for determining progress payments described in Section 01027.

1.4 REVISIONS TO SCHEDULES

- 1.4.1 Whenever KEH determines there are significant variances between actual and scheduled progress, endangering completion within Contract completion time, Contractor may be required to prepare and submit revised schedules.
- 1.4.2 Show progress to date of submittal and projected completion date of each activity. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- 1.4.3 Provide narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken, or proposed, and its effect, including changes on schedules of separate contractors.
- 1.4.4 Distribute copies of revised schedules to KEH Project file, subcontractors, suppliers, and other concerned entities. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in revised schedules.
- 1.4.5 If Contractor fails to submit progress schedule specified in Paragraph 1.3.1 within prescribed time, or updated schedules specified in Paragraph 1.4.1, within requested time, KEH may withhold approval of progress payments until time Contractor submits required schedules.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01400
QUALITY ASSURANCE

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 INSPECTING AND TESTING

1.3.1 In accordance with Section 19 of Contract General Conditions, perform following.

1.3.1.1 Leak/pressure testing required in Sections 02650, 02730, 02745, and 02750.

1.3.1.2 Conductor/pole line material delivery inspection required in Section 02785.

1.3.1.3 Surface examinations required in Sections 09805 and 09900.

1.3.1.4 Electrical testing, delivery inspection of cable and reels required in Section 16300.

1.3.1.5 System testing required in Sections 02730 and 02745.

1.3.1.6 Septic tank test and filter media tests required in Section 02745.

1.3.1.7 Visual examinations required in Section 05500.

1.3.2 In accordance with Section 19 of Contract General Condition, KEH will perform following.

1.3.2.1 Soil testing/asphaltic concrete testing.

1.3.2.2 Concrete testing.

1.3.2.3 Inspection/testing of special protective coating.

1.3.2.4 Inspection of electrical power transmission installations.

1.3.2.5 Cable/transformer testing.

1.3.2.6 Witness specific inspection and witness points.

1.3.2.7 Perform final acceptance inspection.

1.3.3 Specific Inspection and Witness Points

1.3.3.1 Adhere to inspection points required. Ensure personnel have completed inspections of and approved portions of work in accordance with Contract requirements before notifying KEH.

a. Specific inspection and witness points are defined as follows.

1) Construction inspection (H): Required for witnessing of specific construction features, before further construction is allowed to proceed.

2) Receiving (R): Special items of fabrication, equipment, or material scheduled to be delivered to Project site or other designated location which require inspection upon arrival. Notify KEH within 4 hours after arrival of item.

3) Witness (W): Selected for inspection at option of KEH. Work may proceed upon verbal release by KEH or upon expiration of one hour beyond scheduled time of witness.

b. H, R, and W points apply to onsite work. Except where longer period is specified, notify KEH at least 4 working hours before each point for onsite work.

1.3.3.2 H, R, and W points are listed in Article 1.5.

1.4 OPEN ITEM DEFICIENCY

1.4.1 KEH utilizes open items deficiencies to document deviations from Contract requirements.

1.4.1.1 Open item deficiency: Documented on open items lists available from KEH on request. Can be corrected by Contractor without additional direction. Correction shall bring item into compliance with Contract requirements, using approved rework procedures or standards without violating application specifications, codes, or standards.

1.4.1.2 Deleted.

1.4.2 Contractor shall ensure its organization is represented by individuals with sufficient authority to commit Contractor to corrective action requirements identified by KEH.

1.4.3 Open Item deficiencies during performance of Contract require resolution before completion and final payment.

Section Number	Subject	Type	Offsite	Onsite
EARTHWORK				
02200/1	Compaction procedure demonstrations	*H		X
02200/2	Initial backfill over utilities	H		X
02200/3	Initial backfill over drywell	H		X
02200/4	Structural backfill operations	W		X
ROAD SUBGRADE AND GRANULAR BASE				
02235/1	Compaction procedure demonstrations	*H		X
02235/2	Backfill operations	W		X
HOT-LAID ASPHALTIC CONCRETE PAVING				
02512/1	Asphalt paving	W		X
PIPED UTILITIES				
02650/1	Flushing of sanitary and fire water lines	W		X
02650/2	Leak/pressure testing of sanitary and fire water lines	H		X
02650/3	Initial disinfection of new sanitary and fire water lines	H		X
SANITARY SEWAGE				
02730/1	Initial Flushing	W		X
02730/2	All Leak/Pressure Testing	H		X

Section Number	Subject	Type	Offsite	Onsite
PRESSURIZED SEPTIC SYSTEM				
02745/1	Arrival of Pumps, Septic Tanks and Dosing Tank Onsite	R		X
02745/2	Initial Excavation at Sanitary Disposal Field	H**		X
02745/3	Initial Installation of Septic Tanks	H		X
02745/4	Initial Installation of Dosing Tank and Vaults	H		X
02745/5	Initial Installation of Drain Rock and Filter Bed Media	H		X
02745/6	Initial Installation of Geotextile Liner	H		X
02745/7	Initial Backfill Over Geotextile Liner	H**		X
02745/8	All Flushing Operation	W		X
02745/9	All Leak/Pressure Testing	H		X
02745/10	Final System Testing	H**		X
02745/11	Sampling of Filter Bed Media for Independent Testing	H		X
CONTAMINATED LIQUID WASTE DRAIN SYSTEM				
02750/1	Initial fabrication of piping system	H		X
02750/2	Flushing of piping system	W		X
02750/3	Leak/pressure testing of piping system	H		X

Section Number	Subject	Type	Offsite	Onsite
ELECTRIC POWER TRANSMISSION				
02785/1	Conductor, reels, and pole line materials for damage upon arrival at Site	R		X
02785/2	Initial cable pull	W		X
02785/3	Initial splicing	W		X
CAST-IN-PLACE CONCRETE				
03300/1	Concrete placement	H		X
03300/2	Initial concrete finishing	H		X
SPECIAL PROTECTIVE COATING				
09805/1	Before opening containers	H		X
09805/2	Coating application	W		X
MEDIUM VOLTAGE DISTRIBUTION				
16300/1	Arrival of 15 kV cable and reels at site for damage	R		X
16300/2	Initial cable pull	W		X
16300/3	Initial splicing	W		X
16300/4	Electrical testing	W		X
SERVICE AND DISTRIBUTION				
16400/1	Initial installation of transformers and sewage effluent pumps	R		X
16400/2	Initial cable pull	H		X
16400/3	Initial splicing and termination	H		X
16400/4	Meggering of conductors rated 600 volts and used for services, feeders or branch circuit over 150 volts to ground, phase-to-phase, and phase-to-ground	H		X

Section Number	Subject	Type	Offsite	Onsite
SERVICE AND DISTRIBUTION (Continued)				
16400/5	All continuity and phase rotation/testing	W		X
16400/6	Final closure of all electrical enclosures	H		X
	*Note: Allow 3 working days to obtain proctor before backfill.			
	**Note: Notify KEH 7 days before activity is to begin.			
PART 2	- <u>PRODUCTS</u>			
	Not Used			
PART 3	- <u>EXECUTION</u>			
	Not Used			

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 National Fire Protection Association (NFPA)

NFPA 701

Standard Methods of Fire Tests
for Flame-Resistant Textiles and
Films, 1989 Edition

1.1.1.2 Washington State Department of Transportation (WSDOT)

M41-10-91

Standard Specifications for
Road, Bridge, and Municipal
Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Anchoring and Enclosure Methods: Submit methods proposed for anchoring portable structures and enclosing underfloor area to meet the requirements of this Section.

1.2.2 Traffic Control Plan: Submit traffic control plan including signing, locations, and flagging to meet the requirements of this Section.

1.3 CONSTRUCTION FACILITIES

1.3.1 First Aid: Facilities are available at Building 2719WA in the 200 West Area to provide first line medical attention.

1.3.2 Operation and Storage Areas: Confine onsite operations, including storage of materials, to area shown on the Drawings.

1.3.3 Disposal Site for Waste

1.3.3.1 Dispose of broken asphalt and concrete at site approximately 10 road miles from Project. Site is open only during regular working hours.

1.3.3.2 Pile excess excavation inside fenced area at location acceptable to KEH.

1.3.3.3 Dispose of sagebrush at site 1-1/2 miles from construction area.

1.4 TEMPORARY UTILITIES

1.4.1 Water

1.4.1.1 Construction: Available from standpipe outside 200 East Area approximately 2 miles from Site. Furnish hauling, dispensing, and temporary piping. Contractor furnished fittings for connection to water source shall be approved by KEH before installation. Remove temporary piping, hoses, fittings, and valves before final acceptance of the Work. Once sanitary water line is installed at Site and connected, water may be used.

1.4.1.2 Testing: Water for flushing and testing sanitary water line is available at fire hydrant approximately 150 feet from tie-in location. Connect 4-1/2 inch, National Standard Thread, 1/4 turn ball valve with female swivel to 4 inch sexless "Snap-Tite/Storz" quick connect coupling to 4-1/2 inch port for fire department use. Install reduced pressure backflow preventer, similar to BEECO-AERGAP Model 6CM, and slow-opening 2-1/2 inch gate valve to prevent water hammer on each hydrant port intended for construction use. Furnish hydrant wrench, backflow preventers and valves. Wrench shall remain on hydrant at all times. When used, turn hydrant "Full-on" or "Full-off". Partial opening causes damage to hydrant. Turn hydrant off at end of each work day. Provide freeze protection for hydrant and temporary piping or hoses. Fittings provided by Contractor for connection to water source shall be approved by KEH before installation. Remove temporary piping, hoses, fittings, and valves before final acceptance of the Work.

1.4.1.3 Drinking: Available at weather station near Site. Furnish adequate drinking water, that meets health and safety requirements, to employees.

1.4.2 Electric Power: No electrical power available at Site. Once KEH furnished transformers are installed and tied-in to 13.8 kV line, Contractor may make temporary installations to unit with necessary protective equipment, switches, and fixtures.

1.4.3 Telephone

1.4.3.1 Telephone system is operated by General Telephone Company of the Northwest, Inc (GTE). Upon written request, KEH will arrange for telephone service at field offices of Contractor and subcontractors, if facilities are available. Allow at least 4 weeks for installation. KEH will charge Contractor for installation and services in accordance with charge assessed by GTE. Charges will be determined on basis of published tariffs. Information on tariffs may be obtained from DOE's Site Services Contractor, office of the Manager of the Plant Telephone and Radio, Telephone 376-6322.

1.4.3.2 Charges will be deducted from payments due Contractor. Contractor and subcontractors may use provided telephones for long distance calls necessary to the Work. Calls shall be made by valid credit card and cost not charged Site Services Contractor or KEH.

1.4.4 Sanitary Facilities: Furnish and service chemical or other approved sanitary toilets for employee use. Facilities shall meet requirements of KEH which are available upon request.

1.5 ACCESS ROADS AND PARKING AREAS

1.5.1 Grass Fire Prevention: To reduce potential for grass fires, keep off-road driving to minimum. Vehicles driving off-road or to remote locations, shall carry a minimum 10 pound ABC dry chemical portable fire extinguisher, communications equipment consisting of 2 way radio or mobil phone (CB type radios are not acceptable), and shovel. Report fires immediately to nearest Hanford Patrol and Hanford Fire Department.

1.6 TEMPORARY CONTROLS

1.6.1 Dust Control: Maintain work areas to prevent hazard or nuisance to others. Accomplish dust control by sprinkling or other methods approved by KEH. Repeat sprinkling at necessary intervals to keep disturbed area damp at all times. Keep sufficient equipment on Project to accomplish dust control as work proceeds and whenever dust nuisance or hazard occurs. No separate or direct payment will be made for dust control and cost shall be considered incidental to and included in Contract price.

1.6.2 Temporary Enclosures: Plastic sheeting materials used to form enclosures shall be minimum 14 mils thick and have fire retardant properties meeting the requirements of NFPA 701. Acceptable manufacturers are Winman Corp (Plastic Division), St. Cloud, Minnesota; Lancs Industries, Kirkland, Washington; and Protective Plastics, Inc, Greer, South Carolina.

1.6.3 Traffic Control: Temporary traffic control and barricades in accordance with WSDOT M41-10, Section 1-07.23(3). Contractor shall maintain 24 hour single lane traffic access at road crossings outside WSCF Site in accordance with approved submittal.

1.6.3.1 Vehicle and equipment movement

a. Slow moving vehicles and equipment shall not travel on Hanford Site roads during heavy traffic periods between 6:30 and 8:00 am, and 3:30 and 5:30 pm.

b. Do not block existing roads.

c. Do not park on roadway shoulders.

1.6.3.2 Oversized vehicles and loads

a. Permits specified in Section 01065 are required for vehicles or loads exceeding following dimensions.

1) Width: 8'-6".

- 2) Height: 14 feet.
- 3) Length: Single unit, 40 feet. Single trailing unit, 48 feet.

b. Additional requirements for vehicles and loads exceeding 8'-6" width.

- 1) Display oversize load sign on front of towing vehicle and rear of trailing unit.
- 2) Attach red flags to each corner.
- 3) Notify KEH 5 days before moving loads.
- 4) Travel between 9:00 am and 2:30 pm unless special arrangements are made.

c. Escort vehicle requirements.

- 1) Equip with oversize load signs and amber lights.
- 2) Vehicles or loads over 10 feet wide: Provide escort cars in front and rear on 2 lane highways.
- 3) Vehicles or loads over 14 feet wide: Provide escort car in rear on multiple lane highways.
- 4) Vehicles or loads over 20 feet wide: Provide escort cars in front and rear on multiple lane highways.

d. Electrical escort requirements: KEH will provide qualified electrical escorts when load reaches height of 14 feet or more from road surface, or when clearance of at least 6 feet cannot be maintained from overhead electrical or signal lines.

1.7 FIELD OFFICE

1.7.1 Establish field office equipped and staffed to conduct the Work. Keep copies of Drawings, Specifications, and other information pertinent to the Work at office. KEH shall have access to documents at all times. Telephone service will be made available at field office as specified in Paragraph 1.4.3 providing service is available. Contractor may utilize existing telephones, at buildings designated by KEH, for local calls.

1.7.2 Anchor or tie down portable or relocatable structures, including trailers for field offices and storage, to prevent overturning or lateral movement in winds up to 70 mph. Enclose or skirt underfloor area with material that will not burn or support combustion to prevent accumulation of wind-blown debris and use of underfloor space for material storage. Complete anchoring and enclosing, in accordance with approved submittal, within 14 days of arrival onsite.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01610

DELIVERY, STORAGE, AND HANDLING

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 RAILROAD

1.3.1 Railroad shipments are possible into boundaries of the Hanford Site. If Contractor elects to utilize rail transportation, shipments shall be in accordance with this Section.

1.3.2 Carload shipments may be made to Richland, Washington, over Washington Central Railroad from Burlington Northern or Union Pacific Railroads. KEH will arrange for movement of rail cars from Richland to available spurs or sidings on Government owned railroad system within the Hanford Site. KEH is not liable for demurrage charges, or loss or damage to car or lading, unless, loss or damage is due to fault or negligence of KEH.

1.3.3 Investigate availability of rail spurs or sidings in vicinity of the Site. Use of spurs shall be coordinated with other users at the Site. Notify KEH at least 2 working days before scheduled arrival of carload shipments.

1.3.4 Furnish equipment and labor required for unloading, transporting, and handling. Unload each carload within 3 working days after arrival, unless time extension granted by KEH.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01630

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 GENERAL

1.3.1 Products include material, equipment, and systems and shall meet the requirements of the Specifications and referenced standards.

1.3.2 Material and workmanship shall meet the requirements of Section 13 of the Contract General Conditions.

1.3.3 Components required to be supplied in quantity within Specification sections shall be the same and be interchangeable.

1.3.4 Do not use materials and equipment removed from existing structure, except as specifically required or allowed, by Contract Documents.

1.4 PROCEDURES

1.4.1 Approval is not required when product is:

1.4.1.1 Specified by reference standards or by description and proposed product meets the standards.

1.4.1.2 Specified by naming models of manufacturers and product is one specifically named.

1.4.2 Approval is required when product is:

1.4.2.1 Specified by naming models of one or more manufacturers and product not named.

1.4.2.2 Not specified by manufacturer and Specifications require product approval.

1.4.3 Product List

1.4.3.1 Within 15 days after date of notice to proceed, transmit 4 copies of list of major products proposed for installation, including name of manufacturer.

1.4.3.2 Tabulate products by Specification Section number, title, and Article or Paragraph number.

1.4.3.3 For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.4.3.4 KEH will reply within 10 days stating whether there is reasonable objection to listed items. Failure to object to listed item will not constitute waiver of specified requirements.

1.4.4 Limitations on Substitutions

1.4.4.1 Substitutions will not be considered when indicated or implied on fabricator drawings or product data submittals without separate formal request, when requested directly by subcontractor or supplies, or when acceptance will require substantial revision of Contract Documents.

1.4.4.2 Substitute products shall not be ordered or installed without written acceptance.

1.4.4.3 Only one request for substitution for each product will be considered. When substitution is not accepted, provide specified product.

1.4.4.4 KEH will determine acceptability of substitutions.

1.4.5 Requests for Substitutions

1.4.5.1 Submit separate request for each substitution using Form 1151.00, sample attached. Document request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.

1.4.5.2 Identify product by Specification Section and Article or Paragraph numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.

1.4.5.3 Attach, as minimum, product data specified in Section 13 of the Contract General Conditions.

1.4.5.4 Give itemized comparison of proposed substitution with specified product, listing variations, and reference to Specification Section and Article or Paragraph numbers.

1.4.5.5 Give quality and performance comparison between proposed substitution and specified product.

1.4.5.6 Give cost data comparing proposed substitution with specified product, and amount of net change to Contract Sum.

1.4.5.7 List availability of maintenance services and replacement materials.

1.4.5.8 State effect of substitution on construction schedule, and changes required in other work or products. If substituted product requires or necessitates revisions to structures, foundations, footings, services,

systems, piping, electrical, etc, cost of engineering shall be borne by Contractor. Submit for approval drawings, calculations, and vendor data which clearly show revisions to accommodate substitution.

1.4.6 Contractor Representation

1.4.6.1 Request for substitution constitutes representation that Contractor has investigated proposed product and has determined it is equal to or superior to specified product, or that cost reduction offered is ample justification for accepting offered substitution.

1.4.6.2 Provide same warranty for substitution as for specified product.

1.4.6.3 Coordinate installation of accepted substitute, making changes required for work to be completed.

1.4.6.4 Certify cost data presented is complete and includes related costs under the Contract.

1.4.6.5 Waive claim for additional costs related to substitution which may later become apparent.

1.4.6.6 Waive claim for additional performance time resulting from product substitution.

1.4.7 Submittal

1.4.7.1 Submit 4 copies of request for substitution.

1.4.7.2 KEH will review request for substitutions with reasonable promptness.

1.4.7.3 For accepted products, submit fabricator drawings, product data, and samples required in Section 01300.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

From (Contractor) _____ Contract No. _____

Project _____

Description of Proposed Substitution _____

We hereby submit for consideration the following product instead of specified item for above project:

Specification No. _____ Section _____

Drawing No. _____ Section or Zone _____

Specified Item _____

Proposed Substitution _____

Attach complete technical data, including laboratory tests and samples, as applicable.

Provide detailed comparison of the significant qualities (system performance, interface requirements, size weight, durability, performance and similar characteristics, and including visual effect where applicable) for the proposed substitution of comparison with the original requirements.

Describe other changes to drawings and specifications required by proposal as outlined below and attach additional information as necessary.

Complete Each Item

A. Changes to drawing dimensions _____

B. Effect of substitution on other systems _____

C. Outline differences between proposed substitution and specified item _____

D. Manufacturer's guarantees of proposed and specified items are:

_____ Same _____ Different (explain on attachment)

Undersigned attests function, and quality equality equivalent or superior to specified item and has reviewed General Conditions paragraph GC-13 for assignment of responsibility if the substitution is approved.

Submitted By		Signature	
Address		Date	
		Phone	

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Washington Administrative Code (WAC)

Title 296

Labor and Industries

Chapter 296-155

Safety Standards for Construction Work

1.2 SUBMITTALS: Not Used

1.3 RECORD REQUIREMENTS

1.3.1 The nature of work at the Hanford Site requires certain documents, defined herein, be held to record construction process and administration of the Contract. KEH will assemble pertinent data for final disposition. Prepare, preserve, and deliver project record documents to KEH required by this Contract. Documents are in addition to submittals required in Section 01300.

1.3.2 Mark project record documents to identify copies for record and to prevent use for construction. Keep record copies of construction documents in field office and make available to KEH during progress of Work.

1.3.3 Some data required for project records shall be delivered to KEH during course of construction and contract administration, while others shall be assembled after completion of construction for delivery to KEH. Document delivery by retaining copy of reports delivered during course of work until construction completion, retaining copy of letter of transmittal itemizing delivered items, or other means acceptable to KEH.

1.4 PROJECT RECORD DOCUMENTS

1.4.1 General: Documents required for project records are itemized herein. Identify complete documents by title or number. Notes or markings added by hand shall be legible utilizing permanent nonsmearing marking media, such as ink or felt tip markers, in contrasting color.

1.4.2 Contract Documents: Store one set in field office, apart from documents used in construction, and maintain in clean, dry, and legible condition. Legibly mark items to record actual construction, including

changes to dimensions and details, manufacturer's name, catalog number, and substitute products.

1.4.3 Certified Payrolls: Each week file certified payrolls, required by Section 108 of the Contract General Conditions, with KEH and keep copies in field office until Contract completion. Progress payments will not be processed unless certified payrolls for work period have been received by KEH.

1.4.4 Daily Force and Equipment Report: Before noon each day, furnish KEH one copy of detailed daily force report covering labor and supervision of Contractor and subcontractors for previous day. Report shall include general description of work performed and list major items of equipment on site.

1.4.5 Weekly Manpower Report: Complete weekly manpower reports daily and submit weekly, before 10 am on Monday for previous week, during performance period of Contract. Forms will be furnished by KEH.

1.4.6 Weekly Safety Inspection: Document weekly walk around safety inspections by the Contractor and submit weekly. Documentation shall be in accordance with WAC-296-155-100.

1.4.7 Periodic Equipment Checks: Document initial and periodic heavy equipment inspections by the Contractor. Submit to KEH as completed.

1.4.8 Subcontracting Plan Reports: File reports, required by Section 89 of the Contract General Conditions, each quarter with KEH to document conformance with Subcontracting Plan.

1.4.9 Survey Notes, Records, and Documentation: Provide for work required in Section 01050.

1.4.10 Backfill Permit: Retain backfill permits approved for work required in Sections 02200 and 02235.

1.4.11 Soil Compaction Procedure: Retain Form KEH-382 completed for work required in Sections 02200 and 02235.

1.4.12 Soil and Asphalt Tests: Provide copies of tests required in Sections 02200 and 02512.

1.4.13 Flushing/Cleaning Documentation: Provide documentation required in Sections 02650 and 02750 that flushing and cleaning has been accomplished.

1.4.14 Bonding Visual Examination: Provide documentation that visual examination required in Section 02750 has been accomplished.

1.4.15 Leak/Pressure Testing: Provide Documentation that testing required in Sections 02650, 02730, 02745, and 02750 were accomplished.

1.4.16 System Testing: Deliver documentation required in Sections 02730 and 02745.

1.4.17 Water Tightness: Provide documented test results required in Section 02745.

1.4.18 Pour Slips: After obtaining KEH approval of concrete pour slip required in Section 03300, give copy to KEH and retain Contractor copy until Contract closeout to forward to KEH.

1.4.19 Trip Tickets: Deliver to KEH with each truck load of concrete required in Section 03300 and retain Contractor copy until Contract closeout and forward to KEH.

1.4.20 Electrical Test Reports: Provide reports of tests required in Sections 16300 and 16400.

1.4.21 Product Samples and Manufacturer's Instructions: In addition to submittals required in Section 01300 and requirements of this Section, information received by Contractor from suppliers that can document products used and how they were installed shall be forwarded to KEH for Project Records.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

D 653-90 Standard Terminology Relating to Soil, Rock, and Contained Fluids

1.1.1.2 Washington Industrial Safety and Health Act (WISHA)

Washington Administrative Code (WAC)

Title 296, Labor and Industries
Chapter 296-155 WAC, Safety Standards for Construction Work

Part N Excavation, Trenching, and Shoring

1.1.1.3 Washington State Department of Transportation (WSDOT)

M41-10-91 Standard Specifications for Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Method to Prevent Damage During Excavation: Submit procedure proposed to prevent overstressing existing structures or interrupting service to existing facilities. Include drawings and calculations, signed by registered Civil Engineer, of protection method to be used if other than sloping in accordance with Paragraph 3.1.3.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 General: Obtain select soils from excavation or other designated locations. Obtain onsite approval for soils.

2.1.2 Fill or Backfill

2.1.2.1 Structural: Well graded soil mixtures which may contain cobbles up to 3 inches in greatest dimension if uniformly distributed and not constituting more than 20 percent of volume of fill.

2.1.2.2 Common: Well graded soil mixtures containing cobbles up to 8 inches in greatest dimension if uniformly distributed and not constituting more than 40 percent of volume of fill.

2.1.2.3 Deleted.

2.1.2.4 Gravel: Meeting the requirements of WSDOT M41-10, Section 9-03.12(2).

2.1.3 Bedding for Underground Pipe and Conduit: Sand, defined in ASTM D 653.

2.1.4 Granular Base: See Section 02235, subparagraph 2.1.2.2.

2.1.5 Plastic Sheet Marker: 6 inch wide detectable tape similar to "Terra Tape D" manufactured by Griffolyn Co, Inc. Tape shall be imprinted with warning such as "Caution Buried Installation Below" at intervals of not more than 4 feet.

2.1.6 Deleted.

PART 3 - EXECUTION

3.1 EXCAVATION

3.1.1 Before performing excavation, obtain excavation permit. Excavation permits will be furnished as set forth in Section 01065.

3.1.2 Locate and expose underground utilities by hand tools. Use of heavy equipment and machinery is subject to approval of KEH.

3.1.3 Slope sides of excavations or trenches more than 4 feet deep in accordance with WISHA Chapter 296-155 WAC, Part N, Table N-1.

3.1.4 Do not store excavated or other material closer than 2 feet from edge of excavation unless barrier is erected to retain excavated materials. Store and maintain materials in manner that they are prevented from falling or sliding into excavation.

3.1.5 Wherever slopes of excavations will intersect existing underground lines or structures such as building foundations, underground piping, electrical ducts or direct buried electrical lines, install shoring or other means of support to prevent overstressing existing structure or underground lines or to prevent interrupting service to existing buildings.

3.1.6 Footings, Foundations, and Buried Structures

3.1.6.1 Make excavations to depth shown on the Drawings or to further depth necessary to provide undisturbed surface. Make excavations to proper width with allowances made for forms and bracing. Make bottom of excavations compact, level, true, and free of loose material.

3.1.6.2 If over-excavation occurs, correct at time of placing concrete by extending concrete down to undisturbed earth, or by placement of backfill, compacted in accordance with subparagraph 3.2.1.2b, Method C.

3.1.7 Trenches for Underground Piping and Conduit

3.1.7.1 Make excavations to line and grade shown on the Drawings and wide enough to make connections. Excavate with near vertical sides from bottom of trench up to one foot above utility lines. Excavate trench deep enough to permit placement of compacted bedding material, 4 inches minimum thickness, beneath lines except where excavation is in undisturbed sand which will serve as bedding or where lines are to be encased in concrete. Pare holes in trench bottoms for pipe couplings so pipe will bear full length of barrel or section.

3.1.7.2 Install shoring to hold materials and surcharge pressure for full depth of trench.

3.1.7.3 Keep trenches free of standing water when laying is in progress.

3.1.7.4 If over-excavation occurs, correct by placement of structural backfill.

3.2 INSTALLATION

3.2.1 Fill and Backfill

3.2.1.1 General

a. Backfill Permit: Do not start fill or backfill without approved permit as set forth in Section 01065.

b. Remove debris and organic matter from area to be filled or backfilled.

c. Keep materials free of frozen particles, lumps, organic matter, and trash.

d. Do not place fill or backfill on frozen ground.

e. Filling or backfilling by sluicing or flooding with water will not be permitted.

f. Bring fill or backfill up evenly on sides of walls, structures, and utility lines to avoid unbalanced loading.

g. Do not place fill or backfill against concrete structure or foundation wall less than 14 days after completion of structure or wall unless written permission from KEH is obtained. Provide wall support, where noted on the Drawings, before filling or backfilling.

3.2.1.2 Structural

a. Before placement of fill or backfill, demonstrate, to KEH by physical test at site, that procedure proposed for installation and compaction of soils will provide degree of compaction specified. Prepare "Soil Compaction Procedure" Form KEH-0382, sample appended, in accordance with printed instructions. Forms will be furnished by KEH.

b. Place backfill in accordance with WSDOT M41-10, Section 2-03.3(14)C and approved procedure as follows.

1) Use Method C under slabs and pipelines.

2) Use Method B under pavements and roads, and within 5 feet of buildings, fences, other structures, or poles supporting electric lines or pipe.

c. Compaction control tests will be in accordance with WSDOT M41-10, Section 2-03.3(14)D.

3.2.1.3 Common

a. Place fill or backfill in layers not more than 12 inches thick, loose measurement.

b. Compact each layer, full width, by at least one pass of vibratory or rammer type compactor, pneumatic-tired roller, loaded scraper wheel, grader wheel, or power roller.

c. Mound over top layer of backfill to depth of one inch for each 12 inches of trench depth to maximum mound height of 6 inches.

3.2.1.4 Underground piping and conduit trenches

a. Bedding placed beneath utility lines in trenches shall be material meeting the requirements of Paragraph 2.1.3.

b. Place and compact bedding in trench prepared according to subparagraph 3.1.7.1 before laying utility lines. Compact bedding as specified for structural backfill.

c. Place backfill over joints in underground pipes only after pressure testing of line has been completed.

d. Backfill around sides and up to one foot above top of pipe or conduit with bedding material. Place and compact material same as

specified for structural backfill. Compact with care, to avoid misalignment of pipe and provide uniform bearing along barrel of pipe.

e. Backfill utility trenches from elevation one foot above top of pipe as follows.

1) For locations specified in subparagraph 3.2.1.2, use structural backfill.

2) Use common backfill in accordance with subparagraph 3.2.1.3 for other locations.

f. Do not allow heavy construction equipment to pass over buried lines until at least 2 feet of backfill has been placed over line or until bridging has been placed across trenching and approved by KEH.

3.2.2 Plastic Sheet Marker: Place continuous over buried utility lines. Place marker tape directly over line and one foot below finish grade. Place marker over each outside pipe of multiple lines. Place intermediate markers at maximum of 4 feet apart.

3.2.3 Finish Grading: Rake area disturbed by work, remove surface stones larger than 6 inches and dispose of excess material and debris at area designated by KEH.

3.3 FIELD QUALITY CONTROL

3.3.1 Soil Compaction Tests: Sampling and testing of compacted fill and backfill will be performed by KEH.

SOIL COMPACTION PROCEDURE

Project Number	Project Title	Date
Contract Number	Procedure Number	Location of Demonstration
REQUIREMENTS		EQUIPMENT DEMONSTRATED
Applicable Spec./Dwg.		Type
Compaction Required _____ %		Manufacturer
Maximum Lift Size		Model

LABORATORY SOIL TEST RESULTS		
<input type="checkbox"/> Non-granular Materials (WSDOT Test Method No. 609)	<input type="checkbox"/> Granular Materials (WSDOT Test Method No. 606-A)	<input type="checkbox"/> In-Situ
Maximum Density _____ Moisture % _____	<input type="checkbox"/> Density Chart Attached	Density _____

COMPACTION DEMONSTRATION TEST RESULTS							
Formula for Percent Compaction: $\frac{\text{dry density}}{\text{max density}} \times 100 = \text{Percent Compaction}$							
No. of Passes	Depth of Lift	Percent Moisture	Lbs/ft ³ Dry	Maximum Density	Percent Compaction	Accept	Reject

Observations or Comments

TEST METHOD USED FOR DEMONSTRATION	<input type="checkbox"/> Nuclear Gage (ASTM D2922 & D3017)	<input type="checkbox"/> Other _____
---	--	--------------------------------------

Contractor Representative		Date
Engineer/Constructor Inspector		Date

INSTRUCTIONS

This Soil Compaction Procedure form, when approved by the Government Representative, constitutes an approved compaction procedure.

Section A is the responsibility of the Construction Contractor. It is to be completed at the time of backfill compaction demonstration and presented to the Government Representative.

Section B is completed by the Government Representative. Data entered is obtained from the agency that performs the laboratory testing.

Section C is completed by the Government Representative as the demonstration is performed. Using the applicable formula, the percent compaction achieved is determined and entered. Acceptance is based on the results as compared with the compaction percent required in Section A.

Section D is signed and dated by the Construction Contractor Representative acknowledging responsibility for this procedure and compliance thereto for applicable backfill operations. Section D is signed and dated by the Government Representative to signify approval.

END OF SECTION

SECTION 02235

ROAD SUBGRADE AND GRANULAR BASE

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Washington State Department of Transportation (WSDOT)

M41-10-91

Standard Specifications for
Road, Bridge, and Municipal
Construction

1.2 SUBMITTALS: Not Used.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Subgrade Fill and Backfill

2.1.1.1 General: Obtain soils from excavation or other designated locations. Obtain onsite approval for soils.

2.1.1.2 Fill or backfill: Well graded soil mixtures which may contain cobbles up to 3 inches in greatest dimension if uniformly distributed and not constituting more than 20 percent of volume of fill.

2.1.2 Granular Base

2.1.2.1 Base course: Meeting the requirements of WSDOT M41-10, Section 9-03.9(3), Base Course Classification.

2.1.2.2 Leveling course: Meeting the requirements of WSDOT M41-10, Section 9-03.9(3), Top Course Classification.

PART 3 - EXECUTION

3.1 EXCAVATION

3.1.1 Before performing excavation, obtain excavation permit. Excavation permits will be furnished as set forth in Section 01065.

3.1.2 If over-excavation occurs, correct by placement of backfill.

3.2 INSTALLATION

3.2.1 Subgrade Filling and Backfilling

3.2.1.1 Remove debris and organic matter from area to be filled or backfilled.

3.2.1.2 Keep materials free of frozen particles, lumps, organic matter and trash.

3.2.1.3 Do not place fill or backfill on frozen ground.

3.2.1.4 Filling or backfilling by sluicing or flooding with water will not be permitted.

3.2.2 Fill or Backfill

3.2.2.1 Before placement of fill or backfill, demonstrate, to KEH by physical test at site, that procedure proposed for installation and compaction of soils will provide degree of compaction specified. Prepare "Soil Compaction Procedure" Form KEH-0382, sample appended, in accordance with printed instructions. Forms will be furnished by KEH.

3.2.2.2 Place backfill under roads in accordance with WSDOT M41-10, Section 2-03.3(14)C, Method B and approved procedure.

3.2.3 Granular Base

3.2.3.1 Before placement of granular base, demonstrate, to KEH by physical test at site, that procedure proposed for installation and compaction of base will provide degree of compaction specified. Prepare "Soil Compaction Procedure" Form KEH-0382, sample appended, in accordance with printed instructions. Forms will be furnished by KEH.

3.2.3.2 Construction Requirements: Construction shall be in accordance with following sections of WSDOT M41-10.

- a. Subgrade: Section 2-06.3.
- b. Equipment: Section 4-04.3(1).
- c. Mixing: Section 4-04.3(3).
- d. Placing and spreading: Section 4-04.3(4).
- e. Miscellaneous requirements: Section 4-04.3(7).
- f. Weather limitations: Section 4-04.3(8).
- g. Hauling: Section 4-04.3(9).

3.2.3.3 Shaping and Compacting

a. Final shaping before compacting shall be accomplished using approved equipment, and in accordance with WSDOT M41-10, Section 4-04.3(5).

b. Compaction control tests will be in accordance with WSDOT M41-10, Section 2-03.3(14)D.

3.2.4 Finish Grading and Stabilization: Rake area disturbed by work, remove surface stones larger than 6 inches and dispose of excess material and debris at area designated by KEH.

3.3 FIELD QUALITY CONTROL

3.3.1 Sampling and testing of compacted fill and backfill will be performed by KEH.

SOIL COMPACTION PROCEDURE

A	Project Number	Project Title	Date					
	Contract Number	Procedure Number	Location of Demonstration					
	REQUIREMENTS		EQUIPMENT DEMONSTRATED					
	Applicable Spec./Dwg.	Type						
	Compaction Required	%	Manufacturer					
	Maximum Lift Size	Model						
LABORATORY SOIL TEST RESULTS								
B	<input type="checkbox"/> Non-granular Materials (WSDOT Test Method No. 609) <input type="checkbox"/> Granular Materials (WSDOT Test Method No. 606-A) <input type="checkbox"/> In-Situ							
	Maximum Density _____	Moisture % _____	<input type="checkbox"/> Density Chart Attached Density _____					
COMPACTION DEMONSTRATION TEST RESULTS								
Formula for Percent Compaction: $\frac{\text{dry density}}{\text{max density}} \times 100 = \text{Percent Compaction}$								
C	No. of Passes	Depth of Lift	Percent Moisture	Lbs/ft ³ Dry	Maximum Density	Percent Compaction	Accept	Reject
Observations or Comments								
TEST METHOD USED FOR DEMONSTRATION <input type="checkbox"/> Nuclear Gage (ASTM D2922 & D3017) <input type="checkbox"/> Other _____								
D	Contractor Representative							Date
	Engineer/Constructor Inspector							Date

INSTRUCTIONS

This Soil Compaction Procedure form, when approved by the Engineer/Constructor Inspector, documents witnessing and verifying the compaction procedure.

Section A is the responsibility of the Construction Contractor. It is to be completed at the time of backfill compaction demonstration and presented to the Engineer/Constructor Inspector.

Section B is completed by the Engineer/Constructor Inspector. Data entered is obtained from the agency or individual that performed testing.

Section C is completed by the Engineer/Constructor Inspector as the demonstration is performed. Using the applicable formula, the percent compaction achieved is determined and entered. Acceptance is based on the results as compared with the compaction percent required in Section A.

Section D is signed and dated by the Construction Contractor Representative acknowledging responsibility for this procedure and compliance thereto for applicable backfill operations. Section D is signed and dated by the Engineer/Constructor Inspector to signify witnessing and verification.

KEH-0382.00R (03/89)

END OF SECTION

SECTION 02512

HOT-LAID ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Washington State Department of Transportation (WSDOT)
M41-10-91 Standard Specifications for
Road, Bridge, and Municipal
Construction

1.2 SUBMITTALS: Not Used.

1.2.1 Deleted.

1.2.1.1 Deleted.

1.2.1.2 Deleted.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Asphalt: Meeting the requirements of WSDOT M41-10, Sections 9-02.1(2) and 9-02.1(4). Grade of paving asphalt for use in asphaltic concrete mixture shall be AR-4000W.

2.1.2 Aggregate: Class "B" meeting the requirements of WSDOT M41-10, Section 9-03.8(1), (2), (3)B.

2.1.3 Blending Sand: Meeting the requirements of WSDOT M41-10, Section 9-03.8(4).

2.1.4 Mineral Filler: Meeting the requirements of WSDOT M41-10, Section 9-03.8(5).

2.1.5 Premolded Expansion Joint Filler: Meeting the requirements of WSDOT M41-10, Section 9-04.1(2).

2.2 MIXES

2.2.1 Proportioning of Asphalt Concrete Materials: Meeting the requirements of WSDOT M41-10, Section 9-03.8(6) Class "B" asphalt concrete.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Construction: In accordance with following sections of WSDOT M41-10.

3.1.1.1 Asphalt mixing plants: Section 5-04.3(1).

3.1.1.2 Hauling equipment: Section 5-04.3(2).

3.1.1.3 Asphalt pavers: Section 5-04.3(3).

3.1.1.4 Rollers: Section 5-04.3(4).

3.1.1.5 Existing surface conditioning: Section 5-04.3(5). No prime coat required.

3.1.1.6 Asphalt material heating: Section 5-04.3(6).

3.1.1.7 Aggregate preparation: Section 5-04.3(7).

3.1.1.8 Mixing: Section 5-04.3(8).

3.1.1.9 Spreading and finishing: Section 5-04.3(9).

3.1.1.10 Compaction: Section 5-04.3(10). Control may be performed by Virginia Breakover Method.

3.1.1.11 Joints: Section 5-04.3(11).

3.1.1.12 Samples: Section 5-04.3(12).

3.1.1.13 Surface smoothness: Section 5-04.3(13).

3.1.1.14 Heating-planing bituminous pavement: Section 5-04.3(14).

3.1.1.15 Weather limitations: Section 5-04.3(16).

3.1.1.16 Asphalt change in grade: Section 5-04.3(18).

3.1.1.17 Driving surface sealing: Section 5-04.3(19).

3.1.1.18 Premolded expansion joint filler: Install in accordance with manufacturer's recommendations.

3.2 FIELD QUALITY CONTROL

3.2.1 Sampling and testing of asphalt concrete pavement will be performed by KEH.

END OF SECTION

SECTION 02650
PIPED UTILITIES

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American National Standards Institute (ANSI)

ANSI Z53.1-1979 American National Standard
Safety Color Code for Marking
Physical Hazards

1.1.1.2 American Society of Mechanical Engineers (ASME)

B16.3-1985 Malleable Iron Threaded Fittings,
Classes 150 and 300

B16.5-1988 Pipe Flanges and Flanged Fittings

1.1.1.3 American Society for Testing and Materials (ASTM)

A 53-90a Standard Specification for
Pipe, Steel, Black and Hot-
Dipped, Zinc-Coated Welded and
Seamless

A 181-87 Standard Specification for
Forgings, Carbon Steel, for
General-Purpose Piping

A 307-90 Standard Specification for
Carbon Steel Bolts and Studs,
60 000 PSI Tensile Strength

A 563-90 Standard Specification for
Carbon and Alloy Steel Nuts

D 2321-89 Standard Practice for Underground
Installation of Flexible
Thermoplastic Sewer Pipe

1.1.1.4 American Water Works Association (AWWA)

C104-90 American National Standard for
Cement-Mortar Lining for Ductile-
Iron Pipe and Fittings for Water

C110-87	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3 in. Through 48 in., for Water and Other Liquids
C111-85	American National Standard for Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
C151-86	American National Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
C203-86	AWWA Standard for Coal-Tar Protective Coatings and Linings for Steel Water Pipelines-Enamel and Tape-Hot Applied
C500-86	AWWA Standard for Gate Valves for Water and Sewerage Systems
C502-85	AWWA Standard for Dry-Barrel Fire Hydrants
C600-87	AWWA Standard for Installation of Ductile-Iron Water Mains and Appurtenances
C651-86	AWWA Standard for Disinfecting Water Mains
C900-89	AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in., for Water
M23-80	AWWA Manual for PVC Pipe--Design and Installation
1.1.1.5	Factory Mutual System (FM) 1990 Edition
1.1.1.6	Federal Specifications (FS) WW-U-531F
	Approval Guide Unions, Pipe, Steel or Malleable Iron; Threaded Connection, 150 Lb and 250 Lb

- 1.1.1.7 International Association of Plumbing and Mechanical Officials
(IAPMO)
1991 Uniform Plumbing Code (UPC)
- 1.1.1.8 National Fire Protection Association (NFPA)
NFPA 24 Standard for the Installation of Private Fire Service Mains and Their Appurtenances, 1987 Edition
NFPA 1963 Standard for Screw Threads and Gaskets for Fire Hose Connections, 1985 Edition
- 1.1.1.9 Steel Structures Painting Council (SSPC)
SSPC-SP 3-83 No. 3 Power Tool Cleaning
- 1.1.1.10 Underwriters Laboratories, Inc (UL)
1991 Fire Protection Equipment Directory
- 1.1.1.11 Washington State Department of Transportation (WSDOT)
M41-10-91 Standard Specifications for Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Data: Submit information listed in Column 5 of Approval Data List in this Section.

1.2.2 Vendor Information: Submit information listed in Column 5 of Vendor Information List in this Section.

1.2.3 Leak/Pressure Test Procedures: Submit procedures outlining proposed methods of testing joints in piping systems.

1.2.4 NFPA Test Certificate: Submit completed Contractor's Material and Test Certificate in accordance with NFPA 13, Section 1-12.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 General: Components of new underground sanitary water/fire protection systems, if not designated in this Section or the Drawings by

manufacturer's name and model or figure number, shall be current products of manufacturer and be listed or approved for intended use by UL or FM.

2.1.2 Pipe and Fittings: Meet the requirements of NFPA 24, pipe codes in this Section, and details on the Drawings.

2.1.3 Encasement Pipe: Galvanized steel, meeting the requirements of WSDOT M41-10, Section 9-05.1(2). For contaminated liquid waste drain line encasement, use PVC pipe in accordance with AWWA C900, Class 200.

2.1.4 Post Indicator Valve (PIV)

2.1.4.1 Gate valve: Nonrising stem valve with indicator post flange. Valve shall open in counterclockwise direction, have resilient seat, and be manufactured by Kennedy.

2.1.4.2 Indicator post: Adjustable, telescoping barrel type with locking handle and clearly visible, position indicator sign plates, protected by nonbreakable plastic windows. Post shall be matched for assembly to gate valve.

2.1.4.3 Valve position supervisory limit switches for installation on post indicator valves: Tamperproof and designed for use intended. Switches shall be operated during first 2 revolutions of handle in closing direction and be Potter Model PIVSU-A.

2.1.5 Fire Hydrants: Meeting the requirements of AWWA C502, dry barrel type with compression type main valve which opens against pressure. Inlets shall be 6 inches with minimum 5 inch valve opening. Hydrants shall have one 4-1/2 inch pumper nozzle and two 2-1/2 inch hose nozzles, including caps and chains. Nozzle threads shall be National Standard Fire Hose Coupling Threads in accordance with NFPA 1963. Hydrant operating nut and cap nuts shall be National Standard Pentagon in accordance with AWWA C502 and open in counter-clockwise direction. Stem seals shall be O ring type. Hydrants shall be Clow Medallion.

2.1.6 Hydrant Connection Valve: 6 inch gate valve meeting the requirements of AWWA C500 and provided with adjustable cast iron valve box. Valve shall have resilient seat and be manufactured by Kennedy.

2.1.7 Reflective Sheeting: 6 inch wide reflective sheeting for placement around fire hydrant body and 3 inch wide sheeting for placement around barricade posts for fire hydrants, similar to Scotchlite No. 3270 silver "Wide-Angle Flat Top," adhesive coated.

2.1.8 Drainage material for Fire Hydrant Base: Meeting the requirements of WSDOT M41-10, Section 9-03.12(2).

2.1.9 Bitumastic: Similar to Koppers No. 550 or Superservice Black.

2.1.10 Painting: See Section 09900.

2.1.11 Protective Coating for Earth Backfill

2.1.11.1 Carbon steel piping: Factory applied exterior protective coating of coal tar enamel, felt wrap and cover wrap of kraft paper in accordance with AWWA C203.

2.1.11.2 Carbon steel field joints, fittings, and short lengths of pipe: Tapecoat Company "TAPECOAT 20" and primer meeting the requirements of AWWA C203.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 General

3.1.1.1 Install piping and piping accessories in accordance with AWWA C600, NFPA 24, the Uniform Plumbing Code (UPC), the Pipe Codes, the Drawings, and this Section.

3.1.1.2 Keep piping systems clean during work. Once fabrication has started on length of pipe, plug or cap open ends when installation is not in progress to prevent entry of dirt and other foreign material.

3.1.1.3 Where piping is laid in trench, trench shall be free of frost or frozen earth and standing water.

3.1.1.4 Protect from impact shocks and dropping. Before laying, inspect and discard damaged sections.

3.1.1.5 Start laying in finished trenches at lowest point of run and progress upgrade. Support pipe full length of barrel.

3.1.1.6 Handle pipe and accessory materials in accordance with AWWA M23, Chapter 6.

3.1.1.7 Install with alignment and grade in accordance with ASTM D 2321, Section 02200, and the Drawings.

3.1.1.8 Support valve and cast-iron fitting weight on concrete cradle or concrete blocks with anchors.

3.1.1.9 Provide thrust restraint at tees, plugs, caps, valves, and bends in accordance with NFPA 24, Article 8-6.

a. If concrete thrust blocks are used, size blocks as shown on the Drawings.

b. If tie rods are used, install in accordance with 8-6.2.2 through 8-6.2.6.

3.1.2 Carbon Steel Pipe.

3.1.2.1 After cutting, ream pipe to nominal inside diameter. Remove burrs from mating threads in threaded pipe before assembly.

3.1.2.2 Close or butt nipples are not permitted.

3.1.2.3 Make joints in threaded piping systems with specified joint sealant. Apply sealant to male threads only.

3.1.3 Coat carbon steel accessories, which will be buried, such as tie-rods and clamps, with bitumastic. Allow time for bitumastic to dry before backfilling.

3.1.4 Install fire hydrants and hydrant connection valves in accordance with the Drawings and this Section.

3.1.5 Install post barricades around fire hydrants and post indicator valves in accordance with the Drawings and this Section.

3.1.6 Excavation, backfill and grading work shall meet the requirements of Section 02200 as it applies.

3.1.7 Place drainage material at base of fire hydrant in accordance with AWWA C600, Section 3.7. Interface between drainage material and compacted earth fill shall be separated by layer of 30 pound roofing paper.

3.1.8 Fire hydrant base pad shall bear on undisturbed or compacted earth and be minimum 24 inch diameter or square by 4 inch thick precast concrete.

3.1.9 Centerline of fire hydrant pumper nozzle shall be between 18 and 22 inches above adjacent finished grade. Orient pumper nozzle toward roadway or street.

3.1.10 Encase pipe running under roads and pavement with pipe specified in Paragraph 2.1.3.

3.1.11 Painting and Marking

3.1.11.1 Surface preparation, materials, and coating application of primer and paint shall be in accordance with Section 09900.

3.1.11.2 Colors: Defined in ANSI Z53.1.

- a. Fire hydrant yellow.
- b. Upper barrel of indicator post red.
- c. Barricade posts red.

3.1.11.3 After painting is completed, place 6 inch wide reflective band around body of fire hydrant immediately below pumper nozzle. Place 3 inch wide reflective bands around fire hydrant barricade posts as shown on the Drawing.

3.1.12 Flushing

3.1.12.1 Obtain written approval of method for disposal of flushing water from Operating Contractor.

3.1.12.2 After installation and before pressure testing completed system, flush piping with water until effluent is clean and contains no visible particulate matter but in no case for less than one minute.

3.1.12.3 Use sanitary water for flushing sanitary and fire water lines.

3.1.12.4 Flush new piping in accordance with NFPA 24, Article 8-8.

3.1.13 Exterior Protective Coating

3.1.13.1 Complete leak testing before application of exterior protective coating.

3.1.13.2 Protect short lengths of carbon steel pipe and fittings exposed to earth backfill with specified coating.

a. Clean carbon steel surfaces by power wire brushing in accordance with SSPC-SP3.

b. Heat and apply specified tape in accordance with AWWA C203, Section 3, and manufacturer's instructions.

3.1.13.3 After installation, examine carbon steel pipe having factory applied exterior protective coating, and joints, fittings and short lengths of pipe having field applied exterior coating materials.

a. Use electrical holiday detector in accordance with AWWA C203, Section 2.14.12.

b. Repair damage to coating in accordance with AWWA C203, Section 2.15.

3.2 FIELD QUALITY CONTROL

3.2.1 Hydrostatic Testing

3.2.1.1 Furnish instruments, facilities, and labor required to conduct tests.

a. Test gages shall be calibrated and capable of measuring at least 1-1/2 times test pressure, but no more than 4 times test pressure.

3.2.1.2 Document leak/pressure testing of each piping system on NFPA Test Certificate.

3.2.1.3 Perform leak tests in presence of KEH unless otherwise instructed in writing.

3.2.1.4 Perform tests after lines have been flushed and before backfilling.

3.2.1.5 Before applying test pressure to piping, install necessary restraining devices to prevent distortion or displacement of piping.

3.2.1.6 Install one temporary relief valve during pressure testing of systems. Relief valve shall have discharge capacity of at least 125 percent capacity of pressurizing device and be set to operate at not more than 110 percent of test pressure. Demonstrate proper operation of relief valve at following times.

a. Before each series of leak tests before relief valve is attached to system.

b. Whenever KEH has cause to question operating accuracy of relief valve.

3.2.1.7 Verify air has been expelled from piping before applying hydrostatic pressure.

3.2.1.8 Test new piping in accordance with NFPA 24, Article 8-9. Leakage at joints shall not exceed limits specified in NFPA 24, Article 8-9. Repair unsatisfactory joints and retest.

3.2.1.9 If lines are subject to freezing, remove water upon completion of hydrostatic test.

3.2.1.10 Use test pressure shown on pipe codes.

3.3 DISINFECTION

3.3.1 Disinfect new sanitary and fire water lines in accordance with AWWA C651.

3.3.2 Arrange for bacteriological testing of water samples with KEH before performing disinfection procedures. Bacterial analysis is 4 days in length from time samples are received in laboratory. Analysis provides "presumptive" results in 2 days with "confirmation" at end of test.

PIPE CODE A

Service: Max Operating Pressure: Test Pressure: Max Operating Temp:
 Sanitary Water (SW) 120 psig 200 psi 100 F

Sizes	8" and larger
Pipe	PVC in accordance with AWWA C900.
Joints	Elastomeric-gasket couplings in accordance with AWWA C900.
Wall Thickness	Class 200
Fittings	Cast iron or ductile iron Class 250 in accordance with AWWA C110 with cement lining in accordance with AWWA C104 and mechanical or push-on joints in accordance with AWWA C111.
Gate Valves	Iron body, bronze mounted, double disc with bronze wedging device, resilient seat, and O-ring stuffing box in accordance with AWWA C500.
Flexible Couplings	Compression type slip-on steel similar to Dresser Type 38 or 138.
Combination Air Valves	3 inch similar to APCO #147C.3, threaded connections.
Bolting	Carbon steel heavy hex series bolts, ASTM A 307, Grade B, and heavy hex nuts, ASTM A 563, Grade A.
Gaskets	Use full face gaskets with flat face flanges. Compressed synthetic fiber, 1/16 inch thick, similar to Anchor Packing #443.

PIPE CODE B

Service: Max Operating Pressure: Test Pressure: Max Operating Temp:
 Fire Water (F) 120 psig 200 psi 100 F

Sizes	10" and smaller
Pipe	Ductile iron in accordance with AWWA C151 with cement-mortar lining in accordance with AWWA C104.
Joints	Rubber gasketed mechanical or push-on joints in accordance with AWWA C111.
Wall Thickness	Class 50
Fittings	Cast iron or ductile iron Class 250 in accordance with AWWA C110 with cement lining in accordance with AWWA C104 and mechanical or push-on joints in accordance with AWWA C111.
Bolting	Carbon steel heavy hex series bolts, ASTM A 307, Grade B, and heavy hex nuts, ASTM A 563, Grade A.
Gaskets	Use full face gaskets with flat face flanges. Compressed synthetic fiber, 1/16 inch thick, similar to Anchor Packing #443.

PIPE CODE C

Service: Max Operating Pressure: Test Pressure: Max Operating Temp:
 Sanitary Water 120 psig 200 psi 100 F

Sizes	4" and smaller
Pipe	Galvanized steel in accordance with ASTM A 53
Wall Thickness	Schedule 40
Fittings	Class 150 malleable iron, threaded, in accordance with ASME B16.3, galvanized.
Unions	150 lb malleable iron, threaded, bronze seats, in accordance with FS WW-U-531, Type A, Class 1
Flanges	Class 150 forged steel, ASTM A 181, threaded and blind in accordance with ASME B16.5.
Gate Valves	Iron body, bronze mounted, double disc with bronze wedging device, resilient seat, and O-ring stuffing box in accordance with AWWA C500.
Bolting	Carbon steel heavy hex series bolts, ASTM A 307, Grade B, and heavy hex nuts, ASTM A 563, Grade A.
Gaskets	Use full face gaskets with flat face flanges. Compressed synthetic fiber, 1/16 inch thick, similar to Anchor Parking No. 443.

SECTION 02730

SANITARY SEWAGE

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

D 2321-89 Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe

D 3034-89 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

D 3212-89 Standard Specification for Joints for Drain and Sewer Plastic Pipe Using Flexible Elastomeric Seals

F 477-76 (1985) Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

1.1.1.2 American Water Works Association (AWWA)

C151-86 American National Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids

1.1.1.3 Washington State Department of Transportation (WSDOT)

M21-01-85, Including Revisions through May 1991 Standard Plans for Road, Bridge and Municipal Construction

M41-10-91 Standard Specifications for Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Pipe: PVC meeting the requirements of ASTM D 3034, SDR 35 or cement-mortar lined ductile iron pipe meeting the requirements of AWWA C151, Class 50.

2.1.2 Fittings: PVC meeting the requirements of ASTM D 3034, SDR 35.

2.1.3 Transition Couplings: Couplings between PVC and ductile iron pipe shall be water tight and rated by manufacturer for sanitary sewer service.

2.1.4 Manholes: Precast or cast-in-place concrete, 48 inch inside diameter, in accordance with WSDOT M21-01 Standard Plan B-23c.

2.1.5 Clean Out Cover: Cast iron, similar to Josam 58680.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 General

3.1.1.1 Install sanitary sewer in accordance with WSDOT M41-10, Sections 7-17.3(1)B, and 7-17.3(2)A through G, ASTM D 2321, Section 02200, and the Drawings.

3.1.1.2 Use ductile iron pipe for 10 feet minimum each side of sanitary/fire water main crossing whenever sewer line crosses above or has less than 2 feet of clearance between pipes. Joints shall be a minimum of 3 feet horizontal from the sanitary/fire water main.

3.1.1.3 Keep piping systems clean during work. Once fabrication has started on length of pipe, plug or cap open ends when installation is not in progress to prevent entry of dirt and other foreign material.

3.1.1.4 Where piping is laid in trench, trench shall be free of frost or frozen earth and standing water.

3.1.1.5 Protect from impact shocks and dropping. Before laying, inspect and discard damaged sections.

3.1.1.6 Start laying in finished trenches at lowest point of run and progress upgrade. Support pipe full length of barrel.

3.1.1.7 Install manholes in accordance with WSDOT M41-10, Sections 7-05.1, 7-05.2, 7-05.3, and 7-05.3(1).

3.1.2 Flushing

3.1.2.1 Obtain written approval of method for disposal of flushing water from Operating Contractor.

3.1.2.2 After installation, before pressure testing completed system, and before connecting completed system into existing system, flush piping with water until effluent is clean and contains no visible particulate matter but in no case for less than one minute.

3.2 FIELD QUALITY CONTROL

3.2.1 Hydrostatic Testing

3.2.1.1 Furnish instruments, facilities, and labor required to conduct tests.

3.2.1.2 Document leak/pressure testing of system on "Leak/Pressure Test Certification" Form 1757, sample appended.

3.2.1.3 Deliver completed form KEH-1757 to KEH within 10 days after completion of testing.

3.2.1.4 Perform leak tests in presence of KEH unless otherwise instructed in writing.

3.2.1.5 Perform tests after lines have been flushed and before backfilling.

3.2.1.6 Before applying test pressure to piping, install necessary restraining devices to prevent distortion or displacement of piping.

3.2.1.7 Verify air has been expelled from piping before applying hydrostatic pressure.

3.2.2 System Testing

3.2.2.1 Test new sanitary sewer in accordance with WSDOT M411-10, Section 7-17.3(4)B or 7-17.3(4)D and 7-17.3(4)E.

3.2.2.2 Document test results.

3.2.2.3 Deliver test results to KEH within 10 days of testing.

PIPE CODE A

Service: Max Operating Pressure: Test Pressure: Max Operating Temp:

Sanitary Atmospheric 10 ft H2O 120 F
Sewer (SNS)

Size : 4" and larger

Pipe and : PVC in accordance with ASTM D 3034, SDR 35. For locations
Fittings : where sewer line crosses over or within 2 feet of sanitary/
: fire water main, use cement-mortar lined ductile iron pipe
: meeting the requirements of AWWA C151, Class 50.

Joints : Elastomeric gasket type meeting the requirements of
: ASTM D 3212 using restrained gasket meeting the requirements
: of ASTM F 477 or solvent cement joints meeting the
: requirements of ASTM D 3034, SDR 35. Transition couplings
: between PVC and ductile iron pipe shall be water tight and
: rated by manufacturer for sanitary sewer service.

Project or W.O. No. _____	Title _____	Dwg. Reference _____	Test Procedure/Rev. _____
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Construction Spec./Rev. _____	Code or Standard _____	Year _____	Addenda _____	Class _____	Stamp Required <input type="checkbox"/> Yes <input type="checkbox"/> No
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Description of System or Component(s) Test Boundaries

TEST PREPARATION

Notification Requirements <input type="checkbox"/> Quality Control <input type="checkbox"/> Acceptance Inspection <input type="checkbox"/> Safety Engineer <input type="checkbox"/> Client _____ <input type="checkbox"/> Authorized Inspector <input type="checkbox"/> _____	Valve Line-up Requirements (for permanent valves installed) <table style="width:100%;"> <tr> <td style="width:60%;">Valve I.D. _____</td> <td style="width:10%;"><input type="checkbox"/> Open</td> <td style="width:10%;"><input type="checkbox"/> Close</td> <td style="width:20%;"></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> </table>	Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close	
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Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close																							

Required Test Medium Medium _____	Required Test Medium Temp. Temp. _____	Flushing Requirements Flushing _____	<input type="checkbox"/> Blue Chalking Required <input type="checkbox"/> Soap Solution Required
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Design System Pressure _____	Design Test Pressure _____	Specified Hold Time _____	Prepared By _____ Date _____
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PRETEST CHECKLIST

Item or Requirement	Craft Supervision	Quality Control	
		Accept	Date
Valve line-up per design requirements (see above line up).			
Flushing of system and/or component completed per design requirements.			
All lines or components not to be tested are properly isolated or disconnected.			
Vents and openings checked; proper Pressure Relief Valve installed and discharge checked.			
Test medium per design requirements; temperature equalized. Medium _____ Medium Temp. _____ (ASME only)			
Test gauge(s) correct range and currently calibrated. SN _____ Range _____ Cal. Due Date _____ SN _____ Range _____ Cal. Due Date _____ SN _____ Range _____ Cal. Due Date _____			
Pressure Relief Valve properly set and currently calibrated. SN _____ PSI Set _____ Checked Date _____ SN _____ PSI Set _____ Checked Date _____ SN _____ PSI Set _____ Checked Date _____			

KEH-1757.01 (2/88)

KAISER ENGINEERS HANFORD	LEAK/PRESSURE TEST CERTIFICATION	Report No. _____	Page 2 of 2
TEST PERFORMANCE			
Item or Requirement	Quality Control		
	Accept	Date	
RD/TME and other if specified: 50% Tp obtained and examination conducted = Tp _____ Pressure increments at 0.10 Tps: = Tp _____ = Tp _____ = Tp _____ = Tp _____ = Tp _____			
Hydrostatic testing - areas to be inspected chalked prior to application of pressure.			
Hydrostatic testing - examination conducted while system/component pressurized.			
Specified Tp _____		PSI obtained at _____ a.m. p.m.	
Pneumatic Testing - soap solution applied to areas to be tested and system/component examined while pressurized.			
Specified Tp _____		PSI obtained at _____ a.m. p.m.	
Pressure Test <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected	Quality Control Signature	Stamp or PR No.	Date
INSPECTION VERIFICATION			
Documentation properly prepared.	<input type="checkbox"/> Yes <input type="checkbox"/> No	Actual Tp during final inspection _____ PSI	
All joints and welded attachments to pressure retaining components chalked/soaped as applicable.	<input type="checkbox"/> Yes <input type="checkbox"/> No	Specified hold time verified at _____ a.m. p.m.	
All joints and welded attachments to pressure retaining components visually inspected for leakage.	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Pressure Test <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected	Acceptance Inspection Signature	Stamp or PR No.	Date
OTHER			
Comments			
NCR No. (if applicable)	Client Representative	Date	
	Witness - ASME Authorized Inspector	Date	
<input type="checkbox"/> Document Reviewed <input type="checkbox"/> Drawings Highlighted	Construction Engineering	PR No.	Date

END OF SECTION

SECTION 02745

PRESSURIZED SEPTIC SYSTEMS

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Association of State Highway and Transportation Officials (AASHTO)

1989 Standard Specifications for Highway Bridges, 14th Edition

1.1.1.2 American Iron and Steel Institute (AISI)

1986 Edition Specification for the Design of Cold-Formed Steel Structural Members

1.1.1.3 American Society of Mechanical Engineers (ASME)

B1.20.1-1983 Pipe Threads, General Purpose (Inch)

B16.3-1985 Malleable Iron Threaded Fittings, Classes 150 and 300

1.1.1.4 American Society for Testing and Materials (ASTM)

A 48-83 (1990) Standard Specification for Gray Iron Castings

A 53-90a Standard Specification for Pipe, Steel, Black, and Hot-Dipped, Zinc-Coated Welded and Seamless

A 126-84 Standard Specifications for Gray Iron Castings for Valves, Flanges, and Pipe Fittings

A 276-90a Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes

- | | |
|------------|---|
| A 395-80 | Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures |
| B 61-86 | Standard Specification for Steam or Valve Bronze Castings |
| D 1785-89 | Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 |
| D 2241-89 | Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series) |
| D 2466-90a | Standard Specification for Poly (Vinyl chloride) (PVC) Plastic Pipe Fittings, Schedule 40 |
| D 2564-88 | Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings |
| D 2855-90 | Standard Practice for Making Solvent-Cemented with Poly (Vinyl Chloride) (PVC) Pipe and Fittings |
| D 3139-89 | Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals |
| 1.1.1.5 | American Water Works Association (AWWA) |
| C900-89 | AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in., for Water |
| 1.1.1.6 | International Association of Plumbing and Mechanical Officials (IAPMO) |
| 1991 | Uniform Plumbing Code (UPC) |
| 1.1.1.7 | National Fire Protection Association (NFPA) |
| NFPA 70 | National Electrical Code, 1990 Edition |

1.1.1.8 Washington State Department of Transportation (WSDOT)

M41-10-91

Standard Specifications for
Road, Bridge, and Municipal
Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures

1.2.1 Approval Data: Submit information listed in Column 5 of Approval Data List in this Section.

1.2.2 Vendor Information (VI): Submit information listed in Column 5 of Vendor Information List in this Section.

1.2.3 Septic Tank Plans: Submit plans showing dimensions, reinforcing, and structural calculations including certifications of tank capacity and structural capacity. For precast tanks, submit manufacturers certification that the septic tank is approved by the Benton-Franklin Health Department and include manufacturer's installation procedures.

1.2.4 Dosing Tank Plans: Submit plans showing dimensions, reinforcing, structural capacity. For precast tanks, include manufacturer's installation procedures.

1.2.5 Valve Vault Plans: Submit plans showing dimensions, reinforcing, structural capacity. For precast tanks, include manufacturer's installation procedures.

1.2.6 Installer Certification: Submit evidence that installer of septic system is certified by the Benton-Franklin Health Department in accordance with WAC 248-96-175.

1.2.7 Method of Excavation: Submit method of excavation.

1.2.8 Filter Bed Media Lab Report: Submit laboratory report showing that the media meets the requirement of Paragraph 2.1.2.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Concrete: See Section 03300.

2.1.2 Drainage Rock: Washed stone or gravel of uniform size between 3/4 and 1-1/2 inches. Stone or gravel shall be naturally occurring material. Crushed stone will not be permitted.

2.1.3 Geotextile Fabric: Non-woven polyester or polypropylene fabric weighing 4 oz/sq yd or more.

- 2.1.4 Lateral Pipe: PVC Schedule 40 drilled with 3/16 inch holes in accordance with Drawings. Pipe shall conform to ASTM D 1785.
- 2.1.5 Lateral Riser Pipe: 4 inch PVC Schedule 40 conforming to ASTM D 1785.
- 2.1.6 Transport and Header Pipe: PVC SDR 26 meeting the requirements of ASTM D 2241 or PVC PC 150 meeting the requirements of AWWA C900. Joints shall meet requirements of ASTM D 3139.
- 2.1.7 PVC Fittings: Meeting the requirements of ASTM D 2466.
- 2.1.8 Solvent Cement: Meeting the requirements of ASTM D 2564.
- 2.1.9 Valve Vault/Pump Discharge Pipe: Threaded galvanized iron meeting the requirements of ASTM A 53. Pipe threads shall meet the requirements of ASME B1.20.1. Fitting shall be class 150 malleable iron, galvanized and threaded in conformance with ASME B16.3.
- 2.1.10 Swing Check Valves: Class 125 iron with bronze trim conforming to ASTM A 126 Class B.
- 2.1.11 Butterfly Valves: Valve body shall be cast iron conforming to ASTM A 126, Class B. The seat shall be bronze conforming to ASTM B 61. Stem materials shall be stainless steel conforming to ASTM A 276, Type 304. The operator handle shall be a multi-position locking lever handle.

2.1.12 Filter Bed Media

2.1.12.1 Media shall meet particle size criteria as listed below:

<u>Sieve</u>	<u>Particle Size</u>	<u>Percent Passing</u>
3/8 inch	9.50 mm	100
No. 4	4.75 mm	95 to 100
No. 8	2.36 mm	80 to 100
No. 16	1.18 mm	50 to 85
No. 30	0.60 mm	25 to 60
No. 50	0.30 mm	10 to 30
No. 100	0.15 mm	2 to 10

2.1.12.2 Media shall have not more than 45 percent passing any one sieve and retained on the next consecutive sieve, of those listed above.

2.1.12.3 The fineness modulus shall not be less than 2.3, nor more than 3.1.

2.2 COMPONENTS

2.2.1 Septic Tanks: Minimum 2 compartments with minimum fluid capacity of 10,000 gallons. Inlet compartment at least 2/3 total tank capacity.

Tank shall meet the requirements of UPC, Appendix I, be either precast or cast-in-place concrete designed to withstand HS 20-44 load criteria given in AASHTO Figures 3.7.6B and 3.7.7A, and constructed in accordance with UPC, Appendix I, Section 15, Pipe Inc Panel Vault or similar. Provide 24-inch diameter risers with covers to 6 inches above finished grade for access to each tank compartment.

2.2.2 Dosing Tank: Minimum fluid capacity of 6000 gallons. Design chamber to withstand HS 20-44 load criteria in accordance with AASHTO Figures 3.7.6B and 3.7.7A. Precast, similar to Pipe Inc. No. 81410.

2.2.2.1 Dosing Tank Access Cover: Sized as shown on Drawings. The door leaves shall be aluminum diamond pattern plate to withstand a live load of 150 psf. Hardware shall be stainless steel. A representative product is Bilco Co. Model JD.

2.2.2.2 Pre-cast concrete riser: Similar to Pipe Inc No. 4868400.

2.2.2.3 Valve vault: Minimum size as shown on the Drawings. Design the vault to withstand HS 20-44 load criteria in accordance with AASHTO Figures 3.7.6B and 3.7.7A. Precast, similar to Pipe Inc No. 510600 with standard cover.

2.2.3 Flexible Couplings: Installed where shown on Drawings, sized to match the pipe OD of each mating pipe. Representative products include Romac Industries, Inc Style 501 and Rockwell (Smith-Blair) 413 Steel Transition Coupling.

2.2.4 Sewage Effluent Pumps

2.2.4.1 General: Each pump shall be equipped with a 5 hp, submersible electric motor 230/460 volts, 3-phase, 60 hertz, 4 wire service with 35 feet power and sensor cable. Each pump shall discharge through a 6 inch mating cast iron elbow and deliver 325 gpm at 31 TDH. Each pump shall be fitted with 20 feet of lifting cable or chain of adequate strength to permit raising and lowering the pump from the ground surface.

2.2.4.2 Pump design

a. The pump shall be capable of pumping septic tank effluent. The discharge connection elbow shall be permanently installed in the dosing chamber along with the discharge piping. The pumps shall be automatically connected to the discharge elbow when lowered into place. The pumps shall be easily removable for inspection and service and shall not require service personnel to enter the dosing chamber.

b. Sealing of the pumping unit to the discharge connection elbow shall be accomplished by a simple linear downward motion of the pump. A rail guide bracket shall be an integral part of the pump unit. The entire weight of the pumping unit shall be guided by at least two guide bars and pressed tightly against the discharge connection elbow with metal-to-metal

contact. Sealing of the discharge interface by means of a diaphragm, O-Ring, or other device will not be acceptable. No portion of the pump shall bear directly on the floor of the dosing chamber. The pump, with its appurtenances and power cable, shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet.

2.2.4.3 Pump construction

a. Major pump components shall be of ASTM A 48 Class 30B close-grain gray cast iron, with smooth surfaces and passages free of blow holes and other irregularities.

b. Where water tight sealing is required, O-rings shall be used. Exposed nuts and bolts shall be of AISI 304 stainless steel. All external surfaces coming into contact with sewage, other than stainless steel fittings shall be protected by a sewage/wastewater resistant coating.

c. Mating surfaces where watertight sealing is required shall be machined and fitted with nitrile rubber O-rings. Fitting shall be accomplished by metal-to-metal contact between machined surfaces resulting in controlled compression of the nitrile rubber O-rings without the requirement of a specific torque limit. No secondary sealing compounds, rectangular gaskets, elliptical O-rings, grease or other devices shall be used.

d. The cable entry water-tight sealing design shall exclude specific torque requirements or epoxy, silicone, or other sealing compounds to ensure a water tight seal. The cable entry shall comprise of an elastomer grommet, with stainless washer with close tolerance fit, compressed by a combination sealing gland and strain relief fitting. The cable entry junction chamber shall be separated from the motor housing by an isolated terminal board.

e. The pump motor shall be of induction, squirrel-cage design, housed in an air-filled, water-tight chamber. The stator windings shall be dipped and baked to Class F insulation rating which will resist a temperature of 155 C (311 F). The stator shall be heat shrunk fit into the stator housing to ensure perfect alignment. The use of any other means of securing the stator is not acceptable. The motor shall be designed for continuous duty, capable of sustaining 10 starts per hour. At the design point, the stator, winding temperature shall not exceed 125 C, and the motor shall not draw more than 7 amperes at nominal utility supplied voltage. The motor shall be non-overloading across the entire operating range without the use of the service factor.

f. At maximum rated power, pump shall be of adequate design to provide the radiant cooling required by the motor. Cooling jackets or other related devices shall not be necessary for continuous pumping at a sump level below the midpoint of the stator housing.

g. The motor stator shall be protected by 3 low resistant, bi-metallic thermo switches embedded into the stator coil windings. The sensors shall be connected to series with the motor starter coil and used in conjunction with, and supplemental to, third leg overload protection provided by the motor starter.

h. The pump shaft shall be of AISI 316 stainless steel. The shaft shall rotate on 2 permanently lubricated ball bearings. The upper bearing shall be a single row ball bearing and the lower bearing a 2 row angular contact ball bearing. The shaft shall be of such design to provide for a minimum overhang to reduce shaft deflection and prolong bearing life.

i. Each pump shall be provided with a tandem mechanical shaft seal system. The upper mechanical seal shall operate entirely in an oil chamber located just below the stator housing. The upper mechanical seal shall contain one stationary stainless steel ring and one positively driven rotating carbon ring. This upper mechanical seal shall function as a secondary barrier between the pumped liquid and the stator housing. The lower set of mechanical seals shall function as the primary barrier. The lower seal shall contain one stationary silicon carbide ring and one positively driven rotating tungsten carbide ring. Both seal surfaces shall be lubricated and cooled by oil.

j. The tandem seals shall be arranged in a cartridge to ensure perfect installation and alignment, providing for service and inspection without removal of the oil chambers or exposing the bearings.

k. Shaft seals of conventional double seal design using single or double spring action between the upper and lower seal and requiring pressure differentials to offset external pressures are not acceptable.

l. The impeller shall be of ASTM A 395 ductile iron, dynamically balanced, double shrouded, with back pump out vanes, of non-clog smooth contour design without acute turns. The impeller shall be capable of handling septic tank effluent. Securing the impeller to the shaft shall be accomplished by means of a sealing washer and impeller screw of AISI 304 stainless steel.

m. The impeller shall not require coating. Performance data submitted shall be based on the performance of an uncoated impeller. Attempts to improve efficiency shown on the data submitted by coating impellers shall not be acceptable.

n. The pump volute shall be a single piece, non-concentric design, of ASTM A 48 Class 30B close-grain cast iron and shall have smooth contoured fluid passages large enough to pass solid which may pass through the impeller.

o. A wear ring system shall be installed to provide efficient sealing between the volute and the impeller. The wear ring shall consist of a stationary ring of appropriate materials for the application and shall be

easily field adjustable. Rubber or other synthetic materials shall not be acceptable.

p. The pump motor cable, installed, shall be suitable for submersible pump application with P122-MSHA approval indicated by a code or legend permanently embossed on the cable. Cable sizing shall conform to NEC specifications for pump motors.

2.2.4.4 Pump control panel: See Section 16400.

2.2.4.5 Pump warranty: The pump manufacturer shall warrant the units being supplied against defects in workmanship and material for a period of 5 years or 10,000 hours, whichever comes first. The warranty shall be in printed certificate form and apply to similar units.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 Excavate for septic tank, dosing chamber, valve vault, and trenches in accordance with Section 02200.

3.1.2 Install septic tank in accordance with approved submittals and UPC, Appendix I, Section 15.

3.1.3 Install dosing chamber in accordance with Drawings and approved submittals.

3.1.4 Install valve vault in accordance with Drawings and approved submittals.

3.1.5 Backfill around septic tank and dosing chamber with structural fill or backfill in accordance with Section 02200.

3.1.6 Excavate, install, test, and backfill headers and risers in the locations shown on Drawings prior to excavating disposal beds. Run the risers minimum one foot above grade and temporarily cap.

3.1.7 Prior to excavating disposal beds, excavate by backhoe, up to 4 soil investigation pits, each up to 10 feet in depth. Number, location, and depth of pits shall be at the direction of KEH. Pits shall be backfilled to finish grade as directed by KEH.

3.1.8 Excavate the 3 disposal beds to the lines and grades shown on Drawings.

3.1.8.1 If a carbonate cemented soil layer is encountered near or at the bottom of the excavated disposal bed, break soil layer into particles no larger than 8 inches in any dimension by discing, plowing, raking, or other similar operation. Level disposal bed to lines and grades shown on the Drawings.

3.1.9 Install filter bed media on the prepared bed excavation after the media has been certified as described in Paragraph 3.2.5 in one full thickness lift. Distribute and level the media using a tracked type dozer. Do not compact.

3.1.10 Remove smeared or compacted surfaces of disposal beds by raking to minimum depth of one inch below the smeared or compacted surface and remove loose material.

3.1.11 Place drainage rock to full design depth in one lift. Distribute and level drain rock with a minimum of equipment trafficking across the bed. Use tracked type equipment for distribution and leveling. Do not compact.

3.1.12 Construct distribution lines as shown on the Drawings.

3.1.12.1 Solvent cement joints: Meeting the requirements of ASTM D 2855.

3.1.13 Hand excavate trenches 6 inches deep in the drainage rock centered on the risers. Install distribution lines level with orifice holes up except for those indicated on the Drawings which are to be down to promote lateral drainage. After system test (Paragraph 3.2.3) cover completed installation with drainage rock and level.

3.1.14 Install geotextile fabric on leveled drainage rock, lapping seams a minimum of 2 feet.

3.1.15 Complete backfill over geotextile in one lift and grade site using tracked type equipment for drainage away from beds.

3.2 FIELD QUALITY CONTROL

3.2.1 Hydrostatic Testing

3.2.1.1 Furnish instruments, facilities, and labor required to conduct tests.

3.2.1.2 Document leak/pressure testing of system on "Leak/Pressure Test Certification" Form KEH-1757, sample appended.

3.2.1.3 Deliver completed form KEH-1757 to KEH with 10 days after completion of testing.

3.2.1.4 Perform leak tests in presence of KEH unless otherwise instructed in writing.

3.2.1.5 Perform tests after lines have been flushed and before backfilling.

3.2.1.6 Before applying test pressure to piping, install necessary restraining devices to prevent distortion or displacement of piping.

- 3.2.1.7 Verify air has been expelled from piping before applying hydrostatic pressure.
- 3.2.1.8 Test transport, header, riser pipes, and valve vault pipe and appurtenances, to 35 feet head in accordance with WSDOT M41-10 Section 7-17.3(4)B.
- 3.2.2 Air Pressure Testing (may be substituted for hydrostatic test)
- 3.2.2.1 Furnish instruments, facilities, and labor required to conduct tests.
- 3.2.2.2 Document leak/pressure testing of system on "Leak/Pressure Test Certification" Form KEH-1757, sample appended.
- 3.2.2.3 Deliver completed form KEH-1757 to KEH within 10 days after completion of testing.
- 3.2.2.4 Perform leak tests in presence of KEH unless otherwise instructed in writing.
- 3.2.2.5 Perform tests after lines have been flushed and before backfilling.
- 3.2.2.6 Before applying test pressure to piping, install necessary restraining devices to prevent distortion or displacement of piping.
- 3.2.2.7 Test transport, header, riser pipes, and valve vault pipe and appurtenances, to 16 psi in accordance with WSDOT M41-10 Section 7-17.3(4)D and 7-17.3(4)E.
- 3.2.3 System Testing
- a. Prior to backfilling the lateral distribution lines and after pressure testing the transport, header, riser pipes, and valve vault pipe and appurtenances, test the entire system under normal operating conditions.
 - b. Fill the dosing chamber with clean water with the pumps set to the automatic mode. Continue the filling to activate both the alarm and the lag pump start. Operate the pumps through a complete cycle including low water pump off.
 - c. Check all valves for proper position prior to operation.
 - d. Under the supervision of KEH observe the performance of each bed. Pumping duration need only be long enough to confirm that the bed pressurizes uniformly. The vertical rise of water from the laterals shall be between 4 and 6 feet and vary no more than 15 percent between any 2 points.
 - e. Document system testing for compliance with this Section.

f. Deliver documentation to KEH within 10 days after test.

3.2.4 Test and document septic tank and dosing chamber for water tightness in accordance with UPC, Appendix I, Section 110(b). Deliver documentation to KEH within 10 days after test.

3.2.5 Filter Bed Media Tests: Retain an independent laboratory to sample and analyze the media after it arrives onsite and provide certification that the delivered media meets the requirements of Paragraph 2.1.12.

KAISER ENGINEERS HANFORD		LEAK/PRESSURE TEST CERTIFICATION			Report No. _____	Page 1 of 2																								
Project or W.O. No.	Title	Dwg. Reference		Test Procedure/Rev.																										
Construction Spec./Rev.	Code or Standard	Year	Addenda	Class	Stamp Required <input type="checkbox"/> Yes <input type="checkbox"/> No																									
Description of System or Component(s) Test Boundaries																														
TEST PREPARATION																														
Notification Requirements <input type="checkbox"/> Quality Control <input type="checkbox"/> Acceptance Inspection <input type="checkbox"/> Safety Engineer <input type="checkbox"/> Client _____ <input type="checkbox"/> Authorized Inspector <input type="checkbox"/> _____		Valve Line-up Requirements (for permanent valves installed) <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Valve I.D. _____</td> <td style="width: 10%;"><input type="checkbox"/> Open</td> <td style="width: 10%;"><input type="checkbox"/> Close</td> <td style="width: 10%;"></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> <td></td> </tr> </table>					Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close		Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close	
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Required Test Medium Medium _____	Required Test Medium Temp. Temp. _____	Flushing Requirements Flushing _____		<input type="checkbox"/> Blue Chalking Required <input type="checkbox"/> Soap Solution Required																										
Design System Pressure _____	Design Test Pressure _____	Specified Hold Time _____	Prepared By _____		Date _____																									
PRETEST CHECKLIST																														
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Test medium per design requirements; temperature equalized. Medium _____ Medium Temp. _____ (ASME only)																														
Test gauge(s) correct range and currently calibrated.																														
SN _____	Range _____	Cal. Due Date _____																												
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SN _____	Range _____	Cal. Due Date _____																												
Pressure Relief Valve properly set and currently calibrated.																														
SN _____	PSI Set _____	Checked Date _____																												
SN _____	PSI Set _____	Checked Date _____																												
SN _____	PSI Set _____	Checked Date _____																												

KEH-1757.01 (2/88)

SECTION 02750

CONTAMINATED LIQUID WASTE DRAIN SYSTEM

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society of Mechanical Engineers (ASME)

ASME B31.3-1990
w/Addenda a

Chemical Plant and Petroleum
Refinery Piping

1.1.1.2 American Society for Testing and Materials (ASTM)

D 2321-89

Standard Practice for Underground
Installation of Flexible
Thermoplastic Sewer Pipe

D 2837-90

Standard Test Method for
Obtaining Hydrostatic Design
Basis for Thermoplastic Pipe
Materials

D-4101-82 (1988)

Standard Specification for
Propylene Plastic Injection and
Extrusion Materials

1.1.1.3 American Welding Society (AWS)

AWS QC-1-88

Standard for AWS Certification
of Welding Inspector

1.1.1.4 International Association of Plumbing and Mechanical Officials
(IAPMO)

1991

Uniform Plumbing Code (UPC)

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Vendor Information: Submit information listed in Column 5 of Vendor Information List in this Section.

1.2.2 Leak/Pressure Test Procedures: Submit procedures outlining proposed methods of testing joints in piping systems.

1.3 QUALITY ASSURANCE

1.3.1 Qualification of Bonding Personnel and Procedures

1.3.1.1 Personnel and procedures for bonding pressure retaining components along with attachment thereto shall have been qualified in accordance with ASME B31.3 before bonding.

1.3.1.2 Deliver 2 copies of bonding procedure specifications, procedure qualification records, and bonder performance qualification test results to KEH 5 days before bonding. Keep additional copies at locations where bonding is performed.

1.3.2 Qualification of Nondestructive Examination (NDE) Personnel

1.3.2.1 Visual bond examinations and appropriate documentation shall be performed by Certified Welding Inspectors (CWI) who have received certification in accordance with AWS QC-1. Certified Associate Welding Inspectors (CAWI), certified in accordance with above standard, may perform examination when under immediate direction of CWI. Bonding related examination documentation shall be signed, or stamped by individual performing examination. Where CAWI's are used for examinations, documentation shall be signed or stamped by both CAWI and CWI under whom examinations were performed.

1.3.2.2 Maintain file of personnel certifications and written visual examination performance procedures at Site for review.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Store and handle pipe and components in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Piping System: See Pipe Code M-17 and the Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 General

3.1.1.1 Assemble and install pipe system in accordance with ASME B31.3 Paragraph 335, manufacturer's recommendations, the Drawings, and this Section.

3.1.1.2 Keep piping systems clean during work. Once fabrication has started on length of pipe, plug or cap open ends when installation is not in progress to prevent entry of dirt and other foreign material.

3.1.1.3 Where piping is laid in trench, trench shall be free of frost or frozen earth and standing water.

3.1.1.4 Protect from impact shocks and dropping. Before laying, inspect and discard damaged sections.

3.1.1.5 Start laying in finished trenches at lowest point of run and progress upgrade. Support pipe full length of barrel.

3.1.1.6 Handle pipe and accessory materials in accordance with manufacturer's recommendations.

3.1.1.7 Install with alignment and grade in accordance with ASTM D 2321, Section 02200, and the Drawings.

3.1.1.8 Install restraint couplings approximately midway on each straight run of pipe.

3.1.1.9 Keep size of inside bond bead on primary and secondary containment at minimum.

3.1.2 Flushing

3.1.2.1 Obtain written approval of method for disposal of flushing water from Operating Contractor.

3.1.2.2 After installation and before pressure testing completed system, flush with water until effluent is clean and contains no visible particulate matter but in no case for less than one minute.

3.2 FIELD QUALITY CONTROL

3.2.1 Visual Examination

3.2.1.1 Perform examination on 10 percent of completed bonded joints in accordance with ASME B31.3, Paragraphs 341.4.2 and A 341 for Category D service.

3.2.1.2 Document acceptance by CWI stamping of bond identification drawing which shows relative location of bonded joints in drain system.

3.2.1.3 Deliver documentation to KEH within 10 days after completion of examination.

3.2.2 Leak/Pressure Testing

3.2.2.1 Perform testing on carrier and secondary containment pipe in accordance with UPC Section 318(b) and this Section. Use water for test media.

3.2.2.2 Document testing of each piping system on "Leak/Pressure Test Certification" Form KEH-1757, sample appended. Use one or more forms to

describe and record each piping system. Under "Description" describe piping system in enough detail to be correlated to shop fabrication drawings and Contract Drawings, as applicable. For systems tested segmentally, indicate continuity in "Description" to ensure entire system has been tested.

3.2.2.3 Deliver completed Form KEH-1757 to KEH within 10 days after completion of testing.

3.2.2.4 Perform tests after lines have been flushed and before backfilling.

3.2.2.5 Before applying test pressure to piping, install necessary restraining devices to prevent distortion or displacement of piping.

3.2.2.6 If lines are subject to freezing, remove water upon completion of test.

Project or W.O. No.	Title	Dwg. Reference	Test Procedure/Rev.
Construction Spec./Rev.	Code or Standard	Year	Addenda
			Class
			Stamp Required <input type="checkbox"/> Yes

Description of System or Component(s) Test Boundaries

TEST PREPARATION

<p>Notification Requirements</p> <p><input type="checkbox"/> Quality Control</p> <p><input type="checkbox"/> Acceptance Inspection</p> <p><input type="checkbox"/> Safety Engineer</p> <p><input type="checkbox"/> Client _____</p> <p><input type="checkbox"/> Authorized Inspector</p> <p><input type="checkbox"/> _____</p>	<p>Valve Line-up Requirements (for permanent valves installed)</p> <table style="width:100%;"> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> </tr> <tr> <td>Valve I.D. _____</td> <td><input type="checkbox"/> Open</td> <td><input type="checkbox"/> Close</td> </tr> </table>	Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close	Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close	Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close	Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close	Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close	Valve I.D. _____	<input type="checkbox"/> Open	<input type="checkbox"/> Close
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Required Test Medium Medium _____	Required Test Medium Temp. Temp. _____	Flushing Requirements Flushing _____	<input type="checkbox"/> Blue Chalking Required <input type="checkbox"/> Soap Solution Required
Design System Pressure _____	Design Test Pressure _____	Specified Hold Time _____	Prepared By _____ Date _____

PRETEST CHECKLIST

Item or Requirement	Craft Supervision	Quality Control	
		Accept	Date
Valve line-up per design requirements (see above line up).			
Flushing of system and/or component completed per design requirements.			
All lines or components not to be tested are properly isolated or disconnected.			
Vents and openings checked; proper Pressure Relief Valve installed and discharge checked.			
Test medium per design requirements; temperature equalized. Medium _____ Medium Temp. _____ (ASME only)			
Test gauge(s) correct range and currently calibrated.			
SN _____ Range _____ Cal. Due Date _____			
SN _____ Range _____ Cal. Due Date _____			
Pressure Relief Valve properly set and currently calibrated.			
SN _____ PSI Set _____ Checked Date _____			
SN _____ PSI Set _____ Checked Date _____			
SN _____ PSI Set _____ Checked Date _____			

TEST PERFORMANCE

Item or Requirement	Quality Control		
	Accept	Date	
RDT/NE and other if specified:			
50% Tp obtained and examination conducted = Tp _____			
Pressure increments at 0.10 Tp: = Tp _____			
= Tp _____			
= Tp _____			
= Tp _____			
= Tp _____			
Hydrostatic testing - areas to be inspected chalked prior to application of pressure.			
Hydrostatic testing - examination conducted while system/component pressurized. Specified Tp _____ PSI obtained at _____ a.m. p.m.			
Pneumatic Testing - soap solution applied to areas to be tested and system/components examined while pressurized. Specified Tp _____ PSI obtained at _____ a.m. p.m.			
Pressure Test <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected	Quality Control Signature	Stamp or PR No.	Date

INSPECTION VERIFICATION

Documentation properly prepared.	<input type="checkbox"/> Yes <input type="checkbox"/> No	Actual Tp during final inspection _____ p.m.	
All joints and welded attachments to pressure retaining components chalked/soaped as applicable.	<input type="checkbox"/> Yes <input type="checkbox"/> No		
All joints and welded attachments to pressure retaining components visually inspected for leakage.	<input type="checkbox"/> Yes <input type="checkbox"/> No	Specified hold time verified at _____ a.m. p.m.	
Pressure Test <input type="checkbox"/> Accepted <input type="checkbox"/> Rejected	Acceptance Inspection Signature	Stamp or PR No.	Date

OTHER

Comments

NCR No. (if applicable)	Client Representative	Date	
	Witness - ASME Authorized Inspector	Date	
<input type="checkbox"/> Document Reviewed <input type="checkbox"/> Drawings Highlighted	Construction Engineering	PR No.	Date

END OF SECTION

02750 - 8

W-011H-C1 KREW/5/02/27

SECTION 02785

ELECTRIC POWER TRANSMISSION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American National Standards Institute (ANSI)

ANSI C2-1990	American National Standard National Electrical Safety Code, 1990 Edition
ANSI C29.5-1984	American National Standard for Wet-Process Porcelain Insulators- Low- and Medium-Voltage Types
ANSI C135.1-1979	American National Standard for Galvanized Steel Bolts and Nuts for Overhead Line Construction
ANSI C135.2-1987	American National Standard for Threaded Zinc-Coated Ferrous Strand-Eye Anchor Rods and Nuts for Overhead Line Construction
ANSI C135.4-1987	American National Standard for Zinc-Coated Ferrous Eyebolts and Nuts for Overhead Line Construction
ANSI C135.5-1987	American National Standard for Zinc-Coated Ferrous Eynuts and Eyebolts for Overhead Line Construction
ANSI C135.17-1988	American national Standard for Insulator Pins with lead Threads for overhead Line Construction, Galvanized Ferrous Bolt-Type, NA
ANSI C135.30-1988	American National Standard for Zinc-Coated Ferrous Ground Rods for Overhead or Underground Line Construction, NA

- ANSI 05.1-1987 American National Standard for Wood Poles--Specifications and Dimensions
- 1.1.1.2 American Wood Preservers Association (AWPA)
- C7-89 Western Red Cedar, Northern White Cedar and Alaska Yellow Cedar Poles--Preservative Treatment of Incised Pole Butts by the Thermal Process
- C25-89 Sawn Crossarms--Preservative Treatment by Pressure Processes
- P8-89 Standard for Oil-Borne Preservatives
- P9-87 Standard for Solvents and Formulations for Organic Preservative Systems
- 1.1.1.3 Institute of Electrical and Electronics Engineers (IEEE)
- IEEE C62.1-1984 IEEE Standard for Surge Arresters for AC Power Circuits
- 1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.
- 1.2.1 Approval Data: Submit information listed in Column 5 of Approval Data List in this Section.
- 1.3 DELIVERY, STORAGE, AND HANDLING
- 1.3.1 Delivery
- 1.3.1.1 Conductor: Upon delivery to site, inspect ACSR conductor and reels for shipping damage such as:
- a. Marks caused by improper lifting equipment or techniques.
 - b. Breaks or cuts.
 - c. Reel damage from mishandling.
- 1.3.1.2 Pole line material: Upon delivery to site inspect for following.
- a. Poles
 - 1) Type, class, length, physical defects, and decay.
 - 2) Marks caused by improper handling.

b. Crossarms

- 1) Proper type, length, width, and depth.
- 2) Free from twists.

1.3.2 Storage

1.3.2.1 Conductor

- a. Store conductor reels with flanges resting on hard surface or pallet to prevent sinking into ground.
- b. Reel flanges shall not touch conductor on other reels.
- c. Do not store reels on side. Store with reel axis horizontal.
- d. Cap or tape conductor ends to prevent unraveling.

1.3.2.2 Pole line materials

- a. Poles stored longer than 2 weeks shall be stacked on supports at least one foot above ground. Strength and spacing of supports, and manner of stacking shall produce no noticeable distortion in poles.
- b. Locate material stored at site to prevent damage from weather and adjacent construction operations.
- c. Protect crossarms from damage and decay by stacking to provide free circulation of air.

1.3.3 Handling

1.3.3.1 Conductor

- a. Do not drop reels.
- b. Slings and forklifts shall not contact conductor or protective covering.
- c. Use spreader bar when lifting reel with bar and sling.

1.3.3.2 Pole line material

- a. Handle poles, fittings, insulators, and miscellaneous hardware with care to prevent damage. Unload carefully from truck and do not drop. Do not drag poles.
- b. Do not use construction hooks, tongs, or other sharp tools on treated portion of poles.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Wood Poles: Meeting the requirements of ANSI 05.1 and be western red cedar cut from live timber. Poles shall be butt-treated by manufacturer in accordance with AWWA C7, using preservative meeting the requirements of AWWA P8 and P9. Each pole shall be given single top cut at 30 degree angle with normal to axis of pole and at right angles to sweep. Gains shall be cut so roof will be at right angles to line and sweep of pole will be in line. Roofs and gains shall be brush-treated by manufacturer with specified preservative. Each gain shall fit crossarm tightly. Bolt holes shall not be more than 1/16 inch oversize.

2.1.2 Armor Rods: Aluminum alloy, preformed type, similar to ones made by Preformed Line Products Company, for pin insulator supports. Rod diameter and length shall meet the recommendations of aerial line conductor manufacturer.

2.1.3 Connectors: For connecting copper conductors to aluminum conductors shall be manufactured for purpose and listed by UL.

2.1.4 Crossarms: Straight-grained douglas fir, free from twists to within 0.1 inch per foot of length, with bends and twists in only one direction. Apply preservative to crossarms in accordance with AWWA C25 with minimum retention of 8 pcf.

2.1.5 Pole Hardware: Hot-dipped galvanized after fabrication.

- a. Eye bolts and nuts: ANSI C135.4.
- b. Anchor rods and nuts: ANSI C135.2.
- c. Bolts and nuts: ANSI C135.1.
- d. Eye nuts and eyelets: ANSI C135.5.
- e. Insulators: ANSI C136.17.
- f. Ground rods: ANSI C135.30.

2.1.6 Line Conductor: 15 kV overhead line conductor No. 1/0 AWG, ACSR, similar to Raven 6/1, and No. 4 AWG, ASCR, 7/1.

2.1.7 Insulators for 13.8 kV Distribution

2.1.7.1 Distribution: Pin type, ANSI C29.5, Class 55-5, one inch pin hole threads, F neck.

2.1.7.2 Deadend: Clevis type, ANSI C29.5, Class 52-9, 4-1/4 inch diameter, gray color, with aluminum cap and stud, and cotter bolt and key.

2.1.8 Insulator Pin: Forged steel, high tension, standard one inch lead threads, tapered body, 3/4 inch by 6 inches long shank, with saddle washer, nut and locknut for "roofed" wood crossarms; similar to Joslyn No. J119.

2.1.9 Clevis for Attaching Deadend Insulators to Crossarm Double-Arming Bolts: Similar to Chance No. 455.

2.1.10 Deadend Conductor Clamp: Aluminum straight line clamp, clevis type, similar to Joslyn No. 5457.

2.2 EQUIPMENT

2.2.1 Lightning Arresters: Distribution valve type rated 15 kV, 95 BIL, for use on 13.8 kV delta system, meeting the requirements of IEEE C62.1, and similar to Westinghouse No. RMX15DODA21. Porcelain bodies shall be wet porcelain, with uniform color glaze. Galvanized cap and base hardware shall have bolted clamps for both line and ground connections. Mounting bolts shall be galvanized.

2.2.2 Fused Cutout: 15kV, 200 ampere, similar to S&C Type SMC-20, Catalog No. 92122R3G. Fuses furnished and installed by Operating Contractor.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Field Measurements: Scale dimensions on the Drawings show desired and approximate location of equipment, actual locations, distances, and levels shall be governed by field conditions.

3.2 INSTALLATION

3.2.1 General

3.2.1.1 Perform work in accordance with ANSI C2.

3.2.1.2 Install products as shown on the Drawings and specified.

3.2.2 Setting Poles

3.2.2.1 Excavate holes large enough to admit tamping bar around pole at butt. Do not use explosives to excavate holes.

3.2.2.2 Use backfill materials which can be solidly compacted by hand tamping in 6 inch lifts. Compact surplus earth around pole in cone one foot high above grade. Add additional backfill where backfill has settled, and tamp before completion of work.

3.2.2.3 Set 40 foot poles 6'-6" in earth. Measure depth from lowest side, on moderately sloping ground and from point 2'-6" from center of pole toward low side on steep slopes, cuts, embankments, or where soil is likely to be washed away from pole.

3.2.2.4 Set poles plumb and in line, except that strain points which are guyed shall have butts displaced to keep tops in line where feasible. At such locations, rake against strain shall be approximately 3 inches for each 10 feet of height.

3.2.2.5 Backfill holes created by removal of poles and other underground structures to finish grade and solidly compact by hand tamping. Where backfill has settled, place additional backfill and tamp before completion of work.

3.2.2.6 Plug unused holes in poles using treated wood dowel pins. Treat field cut gains and field bored holes with preservative. Cut gains on face of pole with gained surfaces in parallel planes. Shorten poles when required by cutting from top end. Apply hot preservative to shortened end of pole.

3.2.3 Crossarms

3.2.3.1 Mount at right angles to axis of poles.

3.2.3.2 Bolts shall be of sufficient length for full thread engagement of nut, but not protrude through poles or arms in excess of 2 inches. Bolt ends shall not be cut off. Use square washers with each through-bolt and double-arming bolt to protect pole and crossarms.

3.2.4 Guys and Anchors

3.2.4.1 Install anchors to bear against undisturbed earth. Tamp backfill around anchors entire depth of hole. Provide temporary guying required during stringing of conductors. Remove at completion of work.

3.2.4.2 Set guy rods in earth in line with strand and install at least 6 inches above grade.

3.2.5 Insulators: Tighten pin insulators on pin threads and adjust top groove so it is parallel with line. Secure hold nuts with palnuts.

3.2.6 Aerial Conductors

3.2.6.1 Clearances shall be maintained for conductors in accordance with the Drawings, and ANSI C2.

3.2.6.2 String conductors from rotating reels and do not drag along ground nor permit conductors to lie where they may be run over by vehicles. Pull conductors through stringing sheaves or stringing blocks hung on messenger conductor, but do not pull around sharp corners. Inspect conductors as they leave reels and cut out weak or damaged sections and splice ends. Do not make splices in adjacent spans, dead end spans, or within 4 feet of support. Install conductors to proper stringing tensions in accordance with the Drawings.

3.2.6.3 Make splices under tension mechanically and electrically secure by compression fittings. Do not use self-gripping or automatic tension splicing sleeves. Make taps between primary wires, jumpers, etc, with mechanical connectors.

3.2.7 Aerial Equipment Grounding: Ground fused switches and lightning arresters in accordance with the Drawings. Bond together pole line hardware separated by less than 2 inches. Ground messenger conductor of each aerial conductor in accordance with the Drawings. Connect grounding conductor to messenger with split-bolt connector.

SECTION 02935

DRAINFIELD STABILIZATION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Washington State Department of Transportation (WSDOT)

M41-10-91

Standard Specifications for
Road, Bridge, and Municipal
Construction

1.2 SUBMITTALS: Not Used.

1.3 DELIVERY AND STORAGE

1.3.1 Deliver materials to site in undamaged condition. Defective and damaged materials shall be replaced.

1.3.2 Storage: Store materials in dry location protected from weather.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Seed: Meeting the requirements of WSDOT M41-10, Section 9-14.2 and having a mixture of 25 percent intermediate wheat grass, 25 percent crested wheat grass, 15 percent slender wheat grass, 15 percent big blue grass, 10 percent siberian wheat grass and 10 percent perennial rye grass, by weight.

2.1.2 Straw: Meeting the requirements of WSDOT M41-10, Section 9-14.4(1).

2.1.3 Fertilizer: Meeting the requirements of WSDOT M41-10, Section 9-14.3 and shall be controlled release containing either 16 percent nitrogen, 20 percent available phosphoric acid and 20 percent water soluble potash (16-20-20) or 38 percent nitrogen, 0 percent available phosphoric acid, and 0 percent water soluble potash (38-0-0).

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Remove litter, visible rocks, hard lumps, large clods, and debris 6 inches or larger in any dimension.

3.2 INSTALLATION

3.2.1 Smooth and compact soil in accordance with WSDOT M41-10, Section 8-01.3(1) B.

3.2.2 Plant seed, fertilize, and mulch between February 15 and April 15 or September 1 and November 15 in areas shown on the Drawings.

3.2.3 Apply seed at a rate of 60 pounds per acre in accordance with WSDOT M41-10, Section 8-01.3(4) A.

3.2.4 Apply 16-20-20 fertilizer at 500 pounds per acre and 38-0-0 fertilizer at 100 pounds per acre in accordance with WSDOT M41-10, Section 8-01.3(4).

3.2.5 Apply straw at a rate of 4000 pounds per acre in accordance with WSDOT M41-10, Section 8-01.3(5).

3.2.6 Protection and Care: In accordance with WSDOT M41-10, Section 8-01.3(9).

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Concrete Institute (ACI)

ACI 301-89	Specifications for Structural Concrete for Buildings
ACI 305R-89	Hot Weather Concreting
ACI 306.1-87	Standard Specification for Cold Weather Concreting

1.1.1.2 American Society for Testing and Materials (ASTM)

A 615-90	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
A 853-90	Standard Specification for Steel Wire, Carbon, for General Use
C 33-90	Standard Specification for Concrete Aggregates
C 94-90	Standard Specification for Ready-Mixed Concrete
C 150-89	Standard Specification for Portland Cement
C 260-86	Standard Specification for Air-Entraining Admixtures for Concrete

1.1.1.3 National Ready Mixed Concrete Association (NRMCA)

January 1, 1984 (Fourth Revision)	Certification of Ready Mixed Concrete Production Facilities
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1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Certification of Ready Mixed Concrete Production Facilities: Submit current legible copy of "Certificate of Conformance for Concrete Production Facilities" issued by and bearing the seal of the National Ready Mixed Concrete Association. Certificate shall contain signature and seal of registered Civil Engineer.

1.2.2 Reinforcing Steel Fabricator Drawings: Submit complete reinforcing fabrication and placing drawings based on block diagram in accordance with ACI 301, Section 5.1, including splices not shown on the Drawings.

1.2.3 Block Diagram: Submit block diagram of scheduled concrete pours. Identify pours.

1.2.4 Concrete Materials, Mix Design, and Mix Proportions: Submit concrete materials, mix design, and mix proportions in accordance with ACI 301, Sections 3.8 and 16.7.3. Define each material to be used in concrete and state amount, by weight, to be utilized per cubic yard of plastic mix.

1.2.5 Curing Procedure: Submit description of materials and methods of curing in accordance with ACI 301, Section 12.2.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Concrete

2.1.1.1 Cement: ASTM C 150, Type II (Low Alkali).

2.1.1.2 Aggregates: ASTM C 33, maximum size 3/4 inch.

2.1.1.3 Air-entraining admixture: Meeting the requirements of ASTM C 260. Similar to Sika Chemical Company "SIKA AER", Chem-Masters Corp "Adz-Air", or Protex Industries "AES".

2.1.1.4 Properties

a. Minimum allowable compressive strength

1) Tank vault: 5000 psi at 28 days.

2) All other: 3000 psi at 28 days.

b. Slump: 4 inch maximum in accordance with ACI 301, Section 3.5.

c. Air content: In accordance with ACI 301, Table 3.4.1.

- 3.9. d. Proportions: In accordance with ACI 301, Sections 3.8 and 3.9.
- 2.1.1.5 Mixing: In accordance with ASTM C 94.
- 2.1.1.6 Delivery: In accordance with ASTM C 94.
- 2.1.2 Reinforcing Steel
 - 2.1.2.1 Steel bars: ASTM A 615, deformed, Grade 60.
 - 2.1.2.2 Tie wire: Carbon steel, 0.062 inch minimum, annealed, in accordance with ASTM A 853.
- 2.1.3 Nonshrink Grout: Nonmetallic type similar to "Five Star Grout" by US Grout Corp, "Sik Grout 212" by Sika Corp, or "Masterflow 713" by Master Builders.
- 2.1.4 Forms: Wood, steel, plywood, or similar to Masonite Corporation "Concrete Form Presdwood", as required for various specified finishes.
- 2.1.5 Form Coating Materials: Similar to Magic Kote by Symons Corp, Form Shield by AC Horn Inc, or Burke Release #1 by the Burke Company.
- 2.1.6 Waterstops: Polyvinyl chloride (PVC), dumbbell with centerbulb type, 6 inches wide.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Form Construction

- 3.1.1.1 Install formwork in accordance with ACI 301, Section 4.2. Interior shape and rigidity shall be such that finished concrete will meet the requirements of the Drawings within tolerances specified in ACI 301, Table 4.3.1.
- 3.1.1.2 Prepare form surfaces in accordance with ACI 301, Section 4.4 using specified form coating materials, or as described in subparagraph 3.1.1.3.
- 3.1.1.3 Forms for surfaces which will be permanently concealed from view may be saturated with water before placing concrete instead of other treatment, except in freezing weather forms shall be treated with oil or stearate.
- 3.1.1.4 Clean forms of foreign material before placing concrete.

3.2 INSTALLATION

3.2.1 Reinforcing Steel

3.2.1.1 Fabricate bars accurately to dimensions shown on the Drawings, within tolerances shown in ACI 301, Section 5.6.

3.2.1.2 Place as shown on the Drawings within tolerances specified in ACI 301, Sections 5.6 and 5.7.

3.2.1.3 Tie to prevent displacement during placement of concrete.

3.2.1.4 Do not force into concrete after initial set has started.

3.2.1.5 Place with dimension of concrete protection equal to minimum given in ACI 301, Section 5.7, except where shown otherwise on the Drawings.

3.2.2 Concrete

3.2.2.1 Before ordering, obtain approval of required submittals.

3.2.2.2 Before batching, obtain approval of formwork and reinforcement by KEH.

3.2.2.3 Before placing

a. Obtain approval of "Pour Slip" by KEH. "Pour Slip" shall include appropriate reference to specific portion of structure to be placed, maximum size of coarse aggregate, design strength, admixture, and slump. "Pour Slip" forms can be obtained from KEH.

b. For each truck load, deliver "Trip Ticket" to KEH. "Trip Ticket" shall contain information listed in ASTM C 94, subparagraphs 16.1.1 through 16.1.10, and include water/cement ratio.

3.2.2.4 Place in accordance with ACI 301, Sections 8.1, 8.2, and 8.3. Do not drop (free fall) more than 5 feet. Insert vibrator, vertically if possible, into concrete and reach small distance into concrete in next lower layer. Do not insert vibrators into lower courses that have reached initial set. Take care to avoid allowing head of vibrator to come in contact with forms, reinforcement, or embedded items.

3.2.2.5 Temper only as permitted in ACI 301, Section 7.5.

3.2.2.6 Place nonshrink grout where shown on the Drawings and in accordance with manufacturer's recommendations.

3.2.2.7 Weather conditions: Protect concrete during placement in accordance with ACI 301, Section 8.4. Cold weather concreting shall be in accordance with ACI 306.1, Section 1.5.1. Hot weather concreting shall be in accordance with ACI 305R.

3.2.2.8 Construction joints: Make in accordance with ACI 301, Section 6.1, and as detailed on the Drawings.

3.2.2.9 Waterstops: Install in accordance with ACI 301, Section 6.3 and the Drawings.

3.2.2.10 Embedded items: Install in accordance with ACI 301, Sections 6.4 and 6.5, and the Drawings.

3.2.2.11 Placing concrete against earth: Place on or against firm, damp surfaces free of frost, ice and free water. Do not place until required compaction has been obtained. Dampen earth surfaces to receive fresh concrete.

3.2.2.12 Consolidation: Consolidate concrete slabs in accordance with ACI 301, Section 11.6.

3.2.3 Concrete Repair and Form Removal

3.2.3.1 Form removal: Remove in accordance with ACI 301, Section 4.5. Wall forms shall remain in place 5 days unless earlier removal approved by KEH.

3.2.3.2 Cut back form ties and examine concrete surfaces for defects. Repair only after permission for patching is given by KEH.

3.2.3.3 Place concrete repair mortar within one hour after mixing. Do not retemper mortar.

3.2.3.4 Surface defect repair: Repair in accordance with ACI 301, Sections 9.1, 9.2 and 9.3. Cure concrete repairs same as new concrete.

3.2.4 Concrete Finishes and Tolerances

3.2.4.1 Formed surfaces: Start finishing following concrete repair and complete within 96 hours after forms have been removed. Finish in accordance with sections of ACI 301 noted below.

- | | | |
|----|--|----------------|
| a. | Surfaces exposed to earth backfill | Section 10.2.1 |
| b. | Exterior surfaces exposed to weather | Section 10.2.2 |
| c. | Related unformed surfaces | Section 10.5 |
| d. | Surfaces to receive special protective coating | Section 10.3.2 |

3.2.4.2 Unformed surfaces: Finish in accordance with sections of ACI 301 noted below.

- a. Exterior equipment slabs Section 11.7.3
- b. Surfaces to receive special protective coating Section 11.7.3

3.3 FIELD QUALITY CONTROL

3.3.1 Concrete Testing: Sampling and testing of concrete will be the responsibility of KEH. Concrete will be tested to ACI 301, Sections 16.3.4, 16.3.5, 16.3.6 and 16.3.8.

3.4 CURING AND PROTECTION

3.4.1 Curing

3.4.1.1 Cure concrete in accordance with ACI 301, Section 12.2.1.2 or 12.2.1.5. Clear curing compounds shall be tinted or applied surfaces marked to delineate extent of spraying.

3.4.1.2 Do not use curing compound on concrete surfaces to receive special protective coating.

3.4.2 Protection

3.4.2.1 Protect concrete during extreme weather conditions in accordance with ACI 301, Section 12.3.

3.4.2.2 Protect concrete from mechanical injury in accordance with ACI 301, Section 12.4.

END OF SECTION

METAL FABRICATIONS

SECTION 05500

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Institute of Steel Construction (AISC)

ASD Allowable Stress Design (Manual of Steel Construction), 9th Edition

AISC S326 - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings
November, 1978

1.1.1.2 American Society of Mechanical Engineers (ASME)

1989 Edition, W/Addenda through Dec 1990 ASME Boiler and Pressure Vessel Code

Section IX Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators

1.1.1.3 American Society for Testing and Materials (ASTM)

A 36-90 Standard Specification for Structural Steel

A 53-90b Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

A 307-90 Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

A 563-90 Standard Specification for Carbon and Alloy Steel Nuts

F 844-90 Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use

- 1.1.1.4 American Welding Society (AWS)
 - AWS D1.1-90 Structural Welding Code - Steel
- 1.1.1.5 Federal Specifications (FS)
 - RR-G-661E, Grating, Metal, Bar Type
Including AMD 1 (Floor, Except for Naval Vessels)
- 1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.
 - 1.2.1 Fabricator Drawings
 - 1.2.1.1 Fabricator Drawings: Submit fabrication drawings, erection diagrams, and bills of material for structural steel framing.
 - 1.2.1.2 For gratings
 - a. Submit drawings showing overall dimensions, details, and direction of bearing bars in accordance with the Drawings.
 - b. Submit load/deflection tables.
 - 1.2.2 Manufacturer's Data: Submit copies of manufacturer's specifications, dimensioned diagrams, anchor details, and installation instructions for manufactured items.
- 1.3 QUALITY ASSURANCE
 - 1.3.1 Qualification of Welding Personnel and Procedures
 - 1.3.1.1 Personnel and procedures for welding structural steel shall have been qualified in accordance with AWS D1.1 before welding. Qualification in accordance with ASME Section IX may be substituted for this requirement.
 - 1.3.1.2 Maintain file of welding procedure specifications, procedure qualification records, and welder performance qualification test results at Site for review.
- 1.4 DELIVERY, STORAGE, AND HANDLING
 - 1.4.1 Deliver metal fabrications to Project at time convenient for installation. If exposed to inclement weather, protect fabrications with paper, plastic, or other weatherproof covering and store off ground.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Rolled Steel Shapes, Plates, and Bars: ASTM A 36.

2.1.2 Steel Pipe: ASTM A 53 black, standard weight, Schedule 40.

2.1.3 Fasteners

2.1.3.1 Bolts: ASTM A 307, Grade A or B.

2.1.3.2 Nuts: ASTM A 563, Grade A, heavy hex.

2.1.3.3 Washers: ASTM F 844, circular.

2.1.3.4 Expansion anchors: Kwik-Bolt II manufactured by Hilti Fastening Systems.

2.1.3.5 Weld studs: Similar to Nelson Stud Welding Company Type H4L.

2.1.4 Deleted.

2.1.4.1 Deleted.

2.1.5 Metal Grating: Meeting the requirements of FS RR-G-661, Type I, Class 1, Material S, hot-dip galvanized. Grating shall be plain surface type with end banding bars, size shown on the Drawings. Provide manufacturer's standard clips for attachment to framing.

2.1.6 Handrail Fittings: Similar to Speedrail as manufactured by Hollaender Manufacturing Company.

2.1.7 Special Protective Coating: See Section 09805.

2.1.8 Paint: See Section 09900.

2.2 FABRICATION

2.2.1 General

2.2.1.1 Fabricate structural steel for close fit, with erection holes aligned within tolerances given in AISC S326.

2.2.1.2 Fabricate beam-to-column and beam-to-beam connections in accordance with AISC Manual of Steel Construction, Part 4 and Table I; or Table I in combination with Table III.

2.2.1.3 Verify measurements and take field measurements necessary before fabrication. Provide miscellaneous bolts and anchors, supports, braces, and connections necessary for completion of metal fabrications. Cut, reinforce,

drill, and tap metal fabrications shown to receive finish hardware and similar items. Weld or bolt connections as shown on the Drawings.

2.2.1.4 Workmanship: Form metal fabrications to shape and size, with sharp lines, angles, and true curves. Drilling and punching shall produce clean, true lines, and surfaces. Execute and finish work in accordance with fabrication drawings.

2.2.1.5 Jointing and intersections: Accurately made, tightly fitted, and in true planes with adequate fastenings.

2.2.1.6 Perform welding of steel connections in accordance with AWS D1.1, Sections 1 through 8, using E70XX electrodes.

2.2.2 Pipe Handrails and Posts: Fabricate using steel pipe in accordance with the Drawings.

2.2.3 Miscellaneous Steel Items: Supply required clips, frames, equipment supports, and other fabrications shown on the Drawings. Fabricate parts from standard structural sections or shapes, to sizes required. Wherever miscellaneous parts are exposed, grind edges, corners, and rough cuts smooth and free of snags. Shop paint parts except those to be embedded in concrete or masonry, or those which require other specific finishes.

2.2.4 Finishes

2.2.4.1 Paint ferrous metal in accordance with Section 09805. Paint handrail in accordance with Section 09900. Do not coat members to be embedded in concrete or masonry, surfaces, and edges to be field welded, or items to be galvanized.

2.2.4.2 Zinc-rich coating: Similar to Galvicon manufactured by Southern Coating Inc or ZRC Products Co.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Examine areas where metal fabrications are to be installed and notify KEH in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner compatible with requirements for installation. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts, and miscellaneous items having integral anchors, to be embedded in concrete or masonry construction. Coordinate with KEH for delivery of items to Site.

3.2 INSTALLATION

3.2.1 Erect structural steel in accordance with AISC S326, except welding shall be in accordance with this Section.

3.2.2 Install metal fabrications plumb, level or as shown on the Drawings.

3.2.3 Install weld studs in accordance with manufacturer's recommendations.

3.2.4 Install expansion anchors in accordance with manufacturer's recommendations.

3.2.5 Make field connections as neatly as possible with joints flush and smooth. Grind smooth exposed field welds and polish before field painting. Repair welds in galvanized work with 2 coats of zinc-rich coating.

3.2.6 After installation has been approved, clean, and paint connections with primer. Touch-up shop prime coat wherever damaged. Repair breaks in galvanized coatings with zinc-rich coating.

3.2.7 Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, protect surfaces with isolating tape to prevent galvanic or corrosive action.

3.3 FIELD QUALITY CONTROL

3.3.1 Nondestructive Weld Examination (NDE): KEH will perform visual examination in accordance with AWS D1.1, Paragraphs 6.5.5 and 8.15.1.

END OF SECTION

SECTION 09805

SPECIAL PROTECTIVE COATING

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Steel Structures Painting Council (SSPC)

SSPC-SP 10-89

No. 10 Near-White Blast Cleaning

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 List of Materials: Submit complete list of materials, colors and location to be used, to substantiate compliance with the Drawings and this Section.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Deliver materials to site in manufacturer's unopened containers with labels intact. Do not open containers or remove labels until after inspection and acceptance by KEH.

1.3.2 Store materials in accordance with manufacturer's recommendations and in well ventilated area not exposed to excessive heat, sparks, flame or direct rays of sun.

1.3.3 Material safety data sheets shall accompany shipment.

1.4 PROJECT CONDITIONS

1.4.1 Environment for Coating: Coat exterior surfaces only when ambient and surface temperatures are between 50 and 110 F, and temperature is 5 F above dewpoint.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Coating materials shall be products similar to those of following manufacturers.

2.1.2 Primers

2.1.2.1 Embeguard CR by Master Builders, Inc.

2.1.2.2 Phenoline 300 Orange by Carboline Co.

2.1.2.3 Dimetcote Steel Primer 205 by Ameron.

2.1.2.4 Amercoat 187 by Ameron, darkest tint.

2.1.3 Finish Coatings

2.1.3.1 Embeguard CR by Master Builders.

2.1.3.2 Phenoline 302 by Carboline Co.

2.1.3.3 Amercoat 33 by Ameron, grey.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into acceptable condition through preparatory work included in Article 3.2.

3.1.2 Report in writing to KEH conditions that may potentially affect proper application of finish. Do not commence surface preparation or coating application until defects have been corrected and conditions are made suitable.

3.2 PREPARATION

3.2.1 General: Before application, sweep and dust space or area to receive coating.

3.2.2 Pre-Priming

3.2.2.1 Prepare ferrous metals in accordance with SSPC-SP 10, remove abrasive residue and dust, and prime within 4 hours after preparation.

3.2.2.2 Clean concrete surfaces of laitance, oil, stains, dust and other foreign material.

a. Treat concrete with uniform application of one of following solutions.

1) One part 10 percent solution muriatic acid and 3 parts water.

2) 5 percent solution of trisodium phosphate.

b. When solution ceases to foam, rinse thoroughly with clean water and scrub with stiff bristle brush. Allow treated area to thoroughly dry.

c. Allow concrete to cure 28 days before coating is applied, unless shorter period is authorized in writing by KEH.

3.2.3 Post Priming

3.2.3.1 Feather abrasions, chips, skips, and holidays occurring in prime coat by sanding and recoat with material and color to minimum dry film thickness specified.

3.2.3.2 Previously coated surfaces shall be recoated only after existing film is completely dry. Minimum time between coats shall be 72 hours at 60 F, 36 hours at 77 F, and 24 hours at 90 F.

3.2.3.3 Protect coating from rain until dry to touch.

3.2.4 Protection: Provide and install drop cloths, shields, and other protective devices required to protect surfaces adjacent to areas being coated. Keep spatter, smears, droppings, and over-run of coating materials to minimum and remove as coating work progresses.

3.3 APPLICATION

3.3.1 Apply coating materials in accordance with manufacturer's recommendations.

3.3.2 Apply with equipment recommended by manufacturer.

3.3.3 Supply safety equipment necessary for application in confined space of concrete retention vault.

3.4 FIELD QUALITY CONTROL

3.4.1 Inspection: KEH will perform tests to ascertain that coating materials have been applied in accordance with this Section.

3.5 CLEANING

3.5.1 Furnish and maintain at site, closed metal containers for disposal of waste materials. Place materials spotted or soaked with paint, oil, or solvents in containers.

3.5.2 Brushes, rollers, spatulas, and spray equipment shall be thoroughly cleaned after each use and shall contain no oils, thinners, or other residue after cleaning.

3.5.3 Remove empty cans from site at end of each shift.

3.5.4 At completion of coating work, remove materials, containers, rags, cloths, brushes, and other equipment from site. Clean up spills.

3.6 COATING SCHEDULE

		<u>Minimum Wet Film Thickness</u>	<u>Minimum Dry Film Thickness</u>
3.6.1	Concrete		
	Prime: Embeguard CR	8-10 mils	6-8 mils
	Finish: Embeguard CR	8-10 mils	6-8 mils
		OR	
	Prime: Phenoline 300 Orange	13-14 mils	8 mils
	Finish: Phenoline 302	13-14 mils	8 mils
3.6.2	Miscellaneous Ferrous Metals (Nongalvanized)		
	Prime: Dimetcote		
	Steel Primer 205	1.4 mils	0.50 mil
	Second: Amercoat 187	4.5 mils	1.0 mil
	Third: Amercoat 33	6.4 mils	1.5 mils
	Fourth: Amercoat 33	6.4 mils	1.5 mils

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

D 16-90a Standard Definitions of Terms
Relating to Paint, Varnish,
Lacquer, and Related Products

1.1.1.2 Federal Specifications (FS)

TT-E-489H Enamel, Alkyd, Gloss, Low VOC
Content

TT-P-641G, Primer Coating; Zinc
Including AMD 1 Dust-Zinc Oxide (For Galvanized
Surfaces)

TT-P-645B Primer, Paint, Zinc Chromate,
Alkyd Type

1.1.1.3 Military Specification (MS)

DOD-P-15328D, Primer (Wash), Pretreatment
Including AMD 1 (Formula No. 117 For Metals)
and INT AMD 2

1.1.1.4 Steel Structures Painting Council (SSPC)

Surface Preparation Specifications

SSPC-SP 1-82 No. 1 Solvent Cleaning

SSPC-SP 2-89 No. 2 Hand Tool Cleaning

SSPC-SP 3-89 No. 3 Power Tool Cleaning

Paint Specifications

SSPC-Paint 27-82 Basic Zinc Chromate-Vinyl
Butyral Wash Primer

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 List of Materials: Submit list including manufacturers' names, specifications and other data necessary to show compliance with requirements.

1.2.2 Color Samples: Colors will be selected by KEH. Submit samples in form of 3 inch by 5 inch color chips. Describe coating material and color identification on reverse face of each chip. Retain approved samples for use as quality standard of final finishes.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Deliver materials to site in sealed, original, labeled containers, each bearing manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and reducing.

1.3.2 Store materials at minimum ambient temperature of 45 F in well ventilated and heated area or areas.

1.3.3 Take precautions to prevent fire hazards and spontaneous combustion.

1.4 PROJECT CONDITIONS

1.4.1 Environmental Requirements

1.4.1.1 Temperature

a. Unless otherwise recommended by paint manufacturer, apply coatings when ambient and surface temperatures are between 45 and 95 F except water-thinned paints and other special coatings. Apply water-thinned paints when ambient and surface temperature is between 50 and 90 F. Apply varnish on surfaces with minimum temperature of 65 F. Apply epoxy coatings when conditions are within humidity and temperature limits recommended by coating manufacturer.

b. Provide temporary heat as required until specified surface and air temperatures exist for required time period. Maintain temporary heat for 24 hours after paint and finish application.

1.4.1.2 Weather

a. Do no exterior work on unprotected surfaces if it is raining or moisture from other source is present, or expected before applied paints can dry or attain proper cure without damage.

b. Allow wet surfaces to dry and attain required temperatures and conditions specified before proceeding with work, or continuation of previously started work.

c. Do not apply finish in areas where dust is being generated.

1.4.1.3 Ventilation: Provide adequate continuous ventilation required for drying various materials as recommended by paint manufacturer.

1.4.1.4 Illumination: Do not proceed with work unless minimum lighting level of 15 foot-candles is provided on surfaces to be painted or finished. Provide temporary lighting to attain lighting level specified.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Terms used are defined in ASTM D 16.

2.1.2 Pretreatment Wash for Metals: MS DOD-P-15328.

2.1.3 Primers

2.1.3.1 Zinc chromate: FS TT-P-645, (alkyd type). Tint with lamp black to produce color other than yellow.

2.1.3.2 Zinc dust-zinc oxide: FS TT-P-641, Type II.

2.1.4 Paint: Gloss enamel, exterior FS TT-E-489, Class A.

2.1.5 Other Materials: Materials not specifically described but required to achieve specified finishes shall be of high quality and of manufacture approved by KEH.

2.1.6 Special Protective Coatings: See Section 09805.

2.1.7 Hazardous Material Restrictions: Do not use mercurial fungicides in exterior oil paints.

2.1.8 Colors and Tints: Paint manufacturer's standard colors and tints.

PART 3 - EXECUTION

3.1 INSPECTION

3.1.1 Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence, or quality of work and which cannot be put into acceptable condition through preparatory work included in Paragraph 3.2.1.

3.1.2 Report in writing to KEH conditions that may potentially affect proper application of finish. Do not commence surface preparation or coating application until defects have been corrected and conditions are made suitable.

3.2 PREPARATION

3.2.1 New Surface

3.2.1.1 Surfaces to be coated shall be in proper condition to accept, and assure proper adhesion of coating system.

3.2.1.2 Remove mildew by scrubbing with trisodium phosphate, bleach, and detergent solution, then rinse with potable water and let dry.

3.2.1.3 Ferrous metals

a. For shop primed surfaces, apply phosphoric acid etch solution at field welded or abraded spots and let set for time recommended by acid etch manufacturer, rinse with potable water, and when dry, apply prime coat. Wash primed surfaces free of dirt, oil and grease.

b. Prepare ferrous metals in accordance with SSPC-SP 2, or SSPC-SP 3. Mill scale may be present on cleaned surface providing it is fully anchored, gives metallic appearance, and does not cover more than 30 percent of surface, except mill scale will not be permitted on surfaces subject to temperatures in excess of 200 F. Prime ferrous metals within 4 hours after preparation.

3.2.1.4 Galvanized and nonferrous metals: Solvent clean in accordance with SSPC-SP 1 and treat with vinyl type wash coat meeting the requirements of SSPC-Paint 27.

3.2.2 Mixing and Thinning

3.2.2.1 General: Packaged paint may be thinned before application where necessary to suit conditions of surface, temperature, weather, and method of application. Follow manufacturer's instructions or recommendations for thinning packaged paint. Use of thinner shall not relieve Contractor from obtaining complete hiding. Do not mix paints of different manufacturers.

3.2.2.2 Pretreatment wash: Mix by adding one volume of acid component to 4 volumes of resin component. Add acid component slowly to resin component with constant stirring. Use within 8 hours. Material may be reduced with normal butyl alcohol or 99 percent isopropyl alcohol, if thinning is required to maintain wet spray.

3.2.3 Protection

3.2.3.1 Cover or otherwise protect finished work of other trades, surfaces not to be painted, or surfaces not concurrently being painted.

3.2.3.2 Provide sufficient drop cloths, shields and protective equipment to prevent spray or drippings from fouling surfaces not being painted, including surfaces in paint storage and preparation areas.

3.2.3.3 Place cotton waste, cloths, and materials which may constitute fire hazard in closed metal containers and remove daily from site.

3.2.3.4 Where toxic materials, and both toxic and explosive solvents are used, take appropriate precautions in accordance with manufacturer's recommendations and applicable safety regulatory agencies. In applying acid etch coating or solutions to metals, concrete, plaster, and toxic materials to copper, provide ventilation and take protective measures to meet requirements of safety regulatory agencies.

3.3 APPLICATION

3.3.1 Surfaces to be Painted and Finished: Paint surfaces scheduled or shown. Finish factory primed materials in accordance with this Section.

3.3.2 General: Paint may be applied by brush, roller or spray unless otherwise specified. At time of application, paint shall show no signs of deterioration. Maintain uniform suspension of pigments during application.

3.3.2.1 Apply paint so finished surfaces are free of runs, drops, ridges, waves, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete. Apply each coat as film of uniform thickness. Use rollers of type designed for coating to be applied and surface to be coated. Ensure that surfaces including edges, corners, crevices, welds, and rivets receive film thickness equivalent to adjacent painted surfaces.

3.3.3 Coating Progress: Allow time between successive coats to permit proper drying. Modify drying times to suit abnormal environmental conditions. Oil base or oleoresinous solvent-type paints are ready for recoating when paint feels firm, does not deform or feel sticky under moderate pressure of thumb, and application of another coat of paint does not cause lifting or loss of adhesion of undercoat.

3.3.4 Time Between Surface Preparation and Painting: Apply first coat on surfaces that have been cleaned, pretreated and otherwise prepared for painting as soon as practicable after such pretreatment has been completed, but before deterioration of prepared surface.

3.3.5 Pretreatment Wash Coat: Apply vinyl-type wash coat by brush or spray. Maintain wet spray at all times.

3.4 CLEANING

3.4.1 At completion of each day, remove painting materials, empty containers, rags, cloths, brushes, or other equipment. Store or dispose of as appropriate.

3.4.2 As work proceeds and upon completion, promptly remove paint where spilled, splashed or spattered.

3.4.3 At conclusion of work, leave premises neat and clean to satisfaction of KEH.

3.5 PAINTING AND FINISH SCHEDULE

Minimum
Dry Film

3.5.1 Exterior

3.5.1.1 Ferrous Metal, Enamel, Gloss
Pretreatment: MS DOD-P-15328 0.5 mil
Prime Coat: FS TT-P-645 1.5 mil
2nd Coat: FS TT-E-489, Class A 1.5 mil
Finish: FS TT-E-489, Class A 1.5 mil

3.5.1.2 Galvanized Metal, Enamel, Gloss
Pretreatment: MS DOD-P-15328 0.5 mil
Prime Coat: FS TT-P-641, Type II 1.5 mil
2nd Coat: FS TT-E-489, Class A 1.5 mil
Finish: FS TT-E-489, Class A 1.5 mil

3.5.2 Use products of same manufacturer within coating system.

END OF SECTION

SECTION 16300

MEDIUM VOLTAGE DISTRIBUTION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American National Standards Institute (ANSI)

ANSI C2-1990 American National Standard
National Electrical Safety Code

ANSI C80.1-1990 American National Standard for
Rigid Steel Conduit--Zinc Coated

1.1.1.2 Institute of Electrical and Electronics Engineers (IEEE)

IEEE C57.12.00-1987 American National Standard
General Requirements for Liquid-
Immersed Distribution, Power
and Regulating Transformers

1.1.1.3 National Electrical Manufacturers Association (NEMA)

Standards Publication
No. FB 1-1988 Fittings, Cast Metal Boxes, and
Conduit Bodies for Conduit and
Cable Assemblies

Standards Publication/
No. TC 2-1990 Electrical Plastic Tubing (EPT)
and Conduit (EPC-40 and EPC-80)

Standards Publication/
No. TC 3-1982 PVC Fittings for Use with Rigid
PVC Conduit and Tubing

Standards Publication/
No. WC 8-1988 Ethylene-Propylene-Rubber-
Insulated Wire and Cable for the
Transmission and Distribution
of Electrical Energy

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Data: Submit information listed in Column 5 of Approval Data List in this Section.

1.2.2 Vendor Information: Submit information listed in Column 5 of Vendor Information List in this Section.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery

1.3.1.1 Cable: Upon delivery to site, inspect cable and reels for shipping damage such as:

- a. Marks caused by improper lifting equipment or techniques.
- b. Breaks or cuts in outer covering.
- c. Damaged jacket or insulation.
- d. Reel damage from mishandling.

1.3.1.2 Test: Operating Contractor will perform dc overpotential test on new cable upon delivery to site. Acceptance criteria is given in Paragraph 3.3.2.

1.3.2 Storage

1.3.2.1 Cable

- a. Store reels with flanges resting on hard surface or pallet to prevent sinking into ground.
- b. Reel flanges shall not touch cable on other reels.
- c. Do not store reels on side. Store with reel axis horizontal.
- d. Cap or tape cable ends to prevent entrance of moisture.

1.3.3 Handling

1.3.3.1 Cable

- a. Do not drop reels.
- b. Slings and forklifts shall not contact cable or protective covering.
- c. Use spreader bar when lifting reel with bar and sling.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Solderless Connectors and Terminal Lugs: Pressure type, rated for use with copper or aluminum conductors.

2.1.2 Solderless Terminals for Insulated Aerial Conductors: Circumferential compression type; similar to Burndy Corp HYLUG Type YA for copper conductors and Type YA-A for aluminum conductors.

2.1.3 Raceways, Fittings, and Boxes

2.1.3.1 Conduit shall meet the requirements of appropriate standard as follows.

- a. Rigid steel ANSI C80.1
- b. PVC Schedule 80 NEMA TC 2

2.1.3.2 Fittings for rigid steel conduit shall meet the requirements of NEMA FB 1.

2.1.3.3 Fittings for PVC Schedule 80 conduit shall meet the requirements of NEMA TC 3.

2.1.4 Cable: 15 kV single conductor meeting the requirements of NEMA WC 8 for both wet and dry conditions at normal operating temperature of 90 C max.

2.1.4.1 Conductor: Copper, annealed, Class B compacted concentric stranding.

2.1.4.2 Conductor shield: Extruded semi-conducting thermosetting compound, 15 mils thick, minimum.

2.1.4.3 Insulation: Ethylene-propylene-rubber, 220 mils thick, minimum.

2.1.4.4 Insulation shield: Minimum 30 mil extruded nonmetallic covering over insulation with minimum 5 mil nonmagnetic metal component directly over or embedded in covering.

2.1.4.5 Jacket: Black polyethylene, 80 mils average minimum thickness.

2.1.4.6 Cable shall have continuous permanent printing on jacket showing manufacturer's name, trade name, type, size, rated voltage, and footage markings. Cable reels shall be marked to show above information and length of each cable. Ends of cable shall have weatherproof seals and both ends exposed on reel, accessible for testing.

2.1.4.7 Cable terminations: 15 kV similar to Raychem Thermofit.

2.1.4.8 Cable splices: 15 kV, 200 amp, similar to RTE EZ Splice.

2.1.4.9 Cable loadbreak elbows: 15 kV, 200 amp, similar to RTE SBT IV, without test point.

2.1.4.10 Cable insulated bushing protective cap: 15 kV with drain wire similar to RTE, Cat. No. 2603711A12M.

2.1.4.11 Cable loadbreak junctions: 15 kV, 200 amp, similar to RTE Superclose Loadbreak Center Module LBC-4.

2.1.5 Deleted.

2.1.5.1 Manholes: Prefabricated type minimum 6 foot wide by 8 foot long and 7 foot clear inside height with floor draining into small sump, similar to Utility Vault Co, Cat. No. 687-ML with base 687-SB and top cover 687-TL-2-322 '80 style.

2.1.5.2 Deleted.

2.1.6 Deleted.

2.1.7 Deleted.

2.1.8 Wire Pulling Compound: Similar to "Y-er Eas" manufactured by Electro Compound Co, or Polywater manufactured by American Polywater Corp.

2.1.9 Tape

2.1.9.1 Plastic insulating tape: Similar to Scotch No. 33+ manufactured by 3M Company.

2.1.9.2 Conduit protection tape: Similar to Scotchrap No. 50 manufactured by 3M Company.

2.1.10 Insulating Putty: Similar to "Scotchfil" manufactured by 3M Company, GE No. 8389 manufactured by General Electric Co, or "Airseal" manufactured by Kearney Company.

2.1.11 Connectors: For connecting copper conductors to aluminum conductors shall be manufactured for purpose and listed by UL.

2.2 EQUIPMENT

2.2.1 Outdoor Distribution Transformers: Meeting the requirements of ANSI C57.12.00 with kVA and voltage ratings as shown on the Drawings. Transformers shall be single or 3 phase as shown on the Drawings and have standard two 2-1/2 percent above and below normal high voltage taps.

2.2.1.1 Transformers shall be designed for pole mounting.

2.2.2 Lighting Arrestors: Distribution valve type rated 15 kV for use on 13.8kV high resistance grounded system. Westinghouse type RMX or similar.

2.2.3 Fused Cutouts: Open type rated 15 kV, 200 Amp, S&C type SMD-20 or similar with SMU-20 fuse units.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Field Measurements: Scale dimensions on the Drawings show desired and approximate location of equipment, actual locations, distances, and levels shall be governed by field conditions.

3.2 INSTALLATION

3.2.1 General

3.2.1.1 Perform work in accordance with ANSI C2.

3.2.1.2 Install products as shown on the Drawings and specified.

3.2.1.3 Use appropriate special tools when installing devices for which special installation tools are recommended by manufacturer.

3.2.2 Ground Systems: Use galvanized, stranded steel conductors for ground conductors installed in earth or concrete. Make joints connecting copper and galvanized steel conductors above grade and in dry location.

3.2.3 Conduits

3.2.3.1 Deleted.

3.2.3.2 Use PVC Schedule 80 conduit for concrete duct bank encasement.

3.2.3.3 Install concealed conduits as directly as possible and with bend radii as long as possible.

3.2.3.4 Make elbows, offsets, and bends uniform and symmetrical. Bend conduit with approved bending devices.

3.2.3.5 Cut square, ream, and remove burrs. Conduit shall be clean, dry, and free of debris. Immediately after installation, plug or cap exposed ends with standard accessories until wires are installed.

3.2.3.6 Use galvanized steel locknuts and insulated bushings for attachment to enclosures except threaded hubs or sealing locknuts shall be used outdoors or where moisture is present. Threadless fittings will not be permitted for rigid conduit. Use Erickson type couplings where required. Do not use running threads.

3.2.3.7 Deleted.

3.2.3.8 Set up joints in conduit installed in concrete, underground, or exposed to weather, with high temperature, antiseize, conductive thread lubricant and sealant.

3.2.3.9 Deleted.

3.2.3.10 Deleted.

3.2.3.11 Spare ducts shall include nylon or plastic cords of 200 pound minimum breaking strength to facilitate future cable installations. Plug or cap spare ducts to prevent contamination.

3.2.4 Cable

3.2.4.1 Use paint or pressure-sensitive colored tape to identify conductors instead of colored insulation on No. 4 AWG and larger wire only. Maintain phase color coding. Identify equipment grounding conductors clearly throughout system.

3.2.4.2 Use lubricant recommended by cable manufacturer, or wire pulling compound specified, to decrease friction when pulling wire and cable through conduit.

3.2.4.3 Do not install or handle wires with thermoplastic insulation or jacket when ambient temperature is 15 F or below.

3.2.4.4 Do not exceed manufacturer's recommended maximum cable pulling tension.

3.2.4.5 Use pulling device that attaches directly to conductors, not basket grip.

3.2.4.6 Before pulling cables, prepare duct by pulling plug closely approximating diameter of conduit through duct to loosen burrs and ensure there are no obstructions. Follow by pulling wire brush and swab through duct to remove remaining foreign material.

3.2.4.7 Use rotating reels and do not drag along ground or on gravel roads, nor permit conductors to lie where they may be run over by vehicles. Pull conductor through sheaves and pulleys hung in manholes. Inspect conductors as they leave reels for damaged cable. Splices will not be permitted except where installed in manholes.

3.2.5 Splices, Taps, and Cable Terminations

3.2.5.1 Make splices and taps with solderless connectors described in Paragraph 2.1.1. Use connectors in accordance with manufacturer's instructions.

3.2.5.2 Make 15 kV splices in manholes.

3.2.5.3 Follow manufacturer's instructions and directions for splices, loadbreak elbows, and terminations.

3.2.5.4 Wrap terminations for stranded insulated conductors on aerial equipment with 2 half-lapped layers of plastic insulating tape from 2 inches back on cable insulation to completely cover barrel of terminal. Taping

shall affect moisture barrier so moisture cannot penetrate between conductor and insulation or interstices of stranded conductor. Overlay one half-lapped layer of silicon rubber termination tape over plastic insulating tape.

3.2.5.5 Splices and taps of underground primary cable shall be with materials specified in Paragraph 2.1.4. Apply connectors to cable in accordance with manufacturer's instructions. Apply phase color coding tape on cable segments at each splice, tap, and connection.

3.2.5.6 Ground cable shields at both ends and at splices and taps.

3.2.6 Installing Manholes

3.2.6.1 Locate manholes as shown on the Drawings and set with covers or tops to finished grade unless shown otherwise.

3.2.6.2 Replace portions of existing asphalt sidewalks, roadways, and parking lots damaged by excavation with 4 inch depth of asphalt concrete in accordance with Section 02512.

3.2.6.3 Deleted.

3.2.6.4 Deleted.

3.2.6.5 Provide 3 cubic foot drain of 1/2 inch crushed gravel below each sump in manholes.

3.2.6.6 Excavate and install manholes in accordance with manufacturer's recommendations.

3.3 FIELD QUALITY CONTROL

3.3.1 Testing, General

3.3.1.1 Test equipment and wiring for continuity and unintentional grounds, and verify proper phase sequence and voltage at equipment served before attempt is made to operate equipment. Notify KEH before start of tests. Correct items found, during testing or examination by KEH to be at variance with the Drawings and this Section.

3.3.1.2 Furnish instruments, labor and equipment required to conduct the testing.

3.3.1.3 Use test instruments which bear valid calibration stamp showing date of calibration and expiration date of stamp. Calibration and accuracy of test instruments shall be certified by independent testing laboratory having standards traceable to the National Institute of Standards and Technology.

3.3.1.4 In addition to testing specified to be performed by Contractor, installation will be subject to examination by KEH for conformance with design and applicable codes. Assist KEH as requested.

3.3.2 Acceptance Testing

3.3.2.1 Upon receipt of new cable, Operating Contractor will perform following tests.

<u>Test</u>	<u>Acceptance Criteria</u>
a. dc Test Overpotential (Hi-Pot) 15 kV dc shielded cable tested at 55 kV dc for 15 minutes.	Leakage current not to exceed 5 micro- amperes.

3.3.2.2 After installation Operating Contractor will perform following tests to verify acceptability of installation.

<u>Test</u>	<u>Acceptance Criteria</u>
a. Transformer	
. Routine	IEEE C57.12.00
. Resistance Measurement	Not applicable, for base data
. Combustible Gas	Less than 0.5 percent
. Oil Neutralization Number	Less than 0.1 mg KOH/gram
. Oil Dielectric	18 kV or greater
. Oil Interfacial Tension	18 dynes/Cm or greater
. Askarel Content	1 PPM
. Oil Power Factor	1 percent
b. Cable	
. ac Power Factor (not to exceed rated voltage of cable).	Power factor not to exceed 2 percent.
. dc Overpotential (Hi-Pot) 5 kV shielded and nonshielded cable tested at 25 kV dc for 15 minutes. 15 kV shielded cable tested at 55 kV dc for 15 minutes.	Leakage current not to exceed 5 micro-amperes.
. Shield resistance test for shield-to-termination continuity between phases and between each phase and ground. Observe uniformity between resistance readings.	Resistance readings greater than 5 ohms are generally indication of discontinuity (or open circuit) and are not acceptable.

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W-011H-C1
Rev 1

Project No		W-011H-C1 Waste Sampling/		APPROVAL DATA LIST ("X" Indicates Required Data)									
Project Title		Character Facility											
Specification Section		16300											
1 EPN IDENTIFICATION	2 DESCRIPTION	3 REFERENCE DRAWING	4 SPECIFICATION PARAGRAPH	5 DATA								6 REMARKS	
				Dimensional Drawings	Equipment Weights	Specifications	Material Description	Performance Data	Circuit or Control Diagrams	Data Sheets	Illustrative Cuts		Installation Instructions
	Cable, 15 kV		2.1.4			X	X				X	X	
	Cable Terminations, 15 kV		2.1.4.7			X	X	X			X	X	
	Cable Splices, 15 kV		2.1.4.8			X	X	X			X	X	
	Cable Loadbreak Elbows, 15 kV		2.1.4.9			X	X	X			X	X	
	Cable Insulated Bushing Protective Cap		2.1.4.10			X	X	X			X	X	
	Cable Loadbreak Junctions, 15 kV		2.1.4.11	X		X	X	X			X	X	
	Manholes		2.1.5	X	X		X	X			X	X	
	Transformers		2.2.1		X	X		X			X		
	Lighting Arresters		2.2.2			X		X			X		
	Fused Cutouts		2.2.3			X		X			X		

SECTION 16400
SERVICE AND DISTRIBUTION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American National Standards Institute (ANSI)

ANSI C80.1-1983	American National Standard for Rigid Steel Conduit--Zinc Coated
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1.1.1.2 Federal Specifications (FS)

W-C-1094A	Conduit And Conduit Fittings Plastic, Rigid
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W-F-406D	Fittings For Cable, Power, Electrical And Conduit, Metal, Flexible
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1.1.1.4 National Electrical Manufacturers Association (NEMA)

Standards Publication No. FB 1-1988	Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
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Standards Publication/ No. ICS 6-1988	Enclosures for Industrial Controls and Systems
---------------------------------------	--

Standards Publication/ No. RN 1-1986	Polyvinyl-Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
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Standards/Publication/ No. WD 1-1983	General Requirements for Wiring Devices
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1.1.1.5 National Fire Protection Association (NFPA)

NFPA 70	National Electrical Code, 1990 Edition
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1.1.1.6 Underwriters Laboratories, Inc (UL)

1990 Edition	Electrical Appliance and Utilization Equipment Directory
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1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Data: Submit information listed in Column 5 of Approval Data List in this Section.

1.2.2 Vendor Information: Submit information listed in Column 5 of Vendor Information List in this Section.

1.2.3 Seismic Design: Submit calculations and details for design for anchoring electrical systems, components, and equipment to resist seismic forces as required in Section 2312(g) of UBC for Zone 2B.

1.3 QUALITY ASSURANCE

1.3.1 Standards: Products shall be identified for intended purpose by Underwriters Laboratories, Inc. (UL) in the Electrical Appliance and Utilization Equipment Directory or Electrical Construction materials Directory, and bear listing mark of laboratory. In absence of mark, submit documentation of applicable listing. Listing and marking by UL is not required for products specified to meet the requirements of a national standard, or designated by manufacturer's part number on the Drawings or in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Solderless Connectors and Terminal Lugs: Pressure type, rated for use with copper or aluminum conductors with insulating caps or covers rated for system utilization voltage. Connectors shall be types specified below.

2.1.1.1 For conductors No. 8 AWG and smaller.

- a. Similar to Ideal Industries, Inc "Wire-Nuts."
- b. Similar to Thomas and Betts Company "Sta-Kon."
- c. Similar to 3M Company "Scotchlok."

2.1.1.2 For conductors No. 6 AWG and larger.

- a. Similar to Burndy Engineering Company "Screw Pressure Connectors" or "Hydent."
- b. Similar to Thomas and Betts company "Lock-tite."

2.2.2 The Septic Tank Pump Control Panel shall be provided by Pump Manufacturer and consist of:

- a. NEMA Type 4 enclosure - control panel shall have lockable dead front (tamperproof).
- b. Main circuit breaker.
- c. Individual pump motor circuit protector circuit breakers with panel door interlock.
- d. Magnetic non-reversing starters with 3 leg overload protection, heaters, and overload reset pushbuttons.
- e. Control transformer, 480-120 V ac with primary and secondary fuses.
- f. Electric alternator.
- g. Hand-off-auto selector switches (float bulb control).
- h. Green pump operating indicating lights.
- i. Elapsed time meters.
- j. High water alarm (float bulb initiated signal) red beacon light (approximately 4'-0" above panel) and 6 inch bell (100 DB's) with silence switch and auto reset circuit.
- k. Terminal blocks.
- l. Detailed wiring diagram complete with control circuit wire numbers.
- m. Motor cables and watertight hubs.
- n. Float bulb cables.
- o. Float bulb junction box, NEMA Type 4 control support plate and watertight hub.
- p. Float bulbs.
- q. Motor terminal box, NEMA Type 4, 12" sq x 6" deep, continuous hinge, clamp cover with interior panel (locate below control panel).

2.2.3 Telecommunications Manhole: Prefabricated type, 6 foot long by 4 foot wide by 5'-6" high minimum. Similar to Utility Vault Co. Top Section No. 466-T, Base Section No. 466-TB, Riser Section No. 3812, Adapter No. 38-3106, and steel cover with 30 inch by 6 inch flange up with 30 inch diameter clear opening.

2.2.4 Telecommunication Handhole: Prefabricated type, 3'-8" long, 2'-8" wide, 3'-6" high minimum. Similar to Utility Vault No. 233-L with No. 23-233P cover.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Field Measurements: Dimensions on Drawings show desired and approximate location of equipment. Actual locations, distances, and levels shall be governed by field conditions.

3.2 INSTALLATION

3.2.1 General

3.2.1.1 Perform work in accordance with the NEC.

3.2.1.2 Locate equipment, boxes, and conduit approximately where shown in relation to equipment served.

3.2.1.3 Do not install conduit raceways and boxes in positions that interfere with work of other trades.

3.2.1.4 Use appropriate special tools when installing devices for which special installation tools are recommended by manufacturer.

3.2.2 Grounding Systems

3.2.2.1 Underground conductors, electrodes, and connections: Install in accordance with the Drawings. Use galvanized stranded steel conductor for ground conductors installed in earth or concrete. Make joints connecting copper and galvanized steel conductors above grade and in dry location.

3.2.2.2 System and equipment grounding: Solidly ground neutral conductor of 3 wire, 1 phase, and 4 wire, 3 phase, wye-connected distribution systems. Ground equipment in accordance with the Drawings and the NEC.

3.2.3 Conduit

3.2.3.1 Use rigid steel, PVC, or PVC-coated rigid steel conduit as shown on Drawings.

3.2.3.2 Install No. 14 gage galvanized steel pull wire or 1/8 inch polyethylene rope in spare conduits.

3.2.3.3 Install concealed conduits as directly as possible and with bend radii as long as possible.

3.2.3.4 Make elbows, offsets, and bends uniform and symmetrical. Bend conduit with approved bending devices.

3.2.3.5 Cut square, ream, and remove burrs. Conduit shall be clean, dry, and free of debris. Immediately after installation, plug or cap exposed ends with standard accessories until wires are installed.

3.2.3.6 Use galvanized steel locknuts and insulated bushings for attachment to enclosures except threaded hubs or sealing type locknuts shall be used outdoors or where moisture is present. Threadless fittings will not be permitted for rigid conduit. Use Erickson type couplings where required. Do not use running threads.

3.2.3.7 Use one hole clamps equipped with clampbacks or Unistrut with clamps to secure conduits.

3.2.3.8 Install without moisture traps wherever possible. Where practicable, provide drain holes in terminal boxes and pullboxes or fittings at low points in raceway systems and remove burrs from drilled holes.

3.2.3.9 Set up joints in conduit installed in concrete, underground, or exposed to weather, with high temperature, antiseize, conductive thread lubricant and sealant.

3.2.3.10 Install exposed conduit stubbing up through concrete slab or grade straight and plumb, lined up, and uniformly spaced. Install at sufficient depth below slab to eliminate part of bend above top of slab. Cap or plug stub-up before placing concrete. Verify stub-up locations with final equipment arrangements.

3.2.3.11 Seal opening around conduit at exterior wall penetrations and penetrations of walls which form boundaries between adjoining ventilation zones, using specified sealant. Make seal waterproof and finish sealant flush with surrounding wall surface.

3.2.3.12 Install PVC coated conduit in accordance with manufacturer's recommendations. Repair coating, damaged during handling or installation using PVC paint recommended by conduit manufacturer.

3.2.4 Boxes, Enclosures, and Wiring Devices: Install boxes firmly in position and plumb.

3.2.5 Conductors

3.2.5.1 Do not bend cables installed in wireways to less than manufacturer's recommended minimum bending radius.

3.2.5.2 Maximum pulling tension on conductors: Recommended by manufacturer.

3.2.5.3 Paint or pressure-sensitive colored tape may be used for coding conductors instead of colored insulation on No. 8 AWG and larger wire only. Maintain phase color coding, in accordance with the Drawings, for branch and

feeder circuits up to and including equipment connections. Use colored tape to properly code existing conductors whose color does not comply.

a. Color coding for 480/277 V, 3-phase systems

- 1) Grounded neutral gray
- 2) Grounding conductor green or bare
- 3) Phase "A" (ungrounded) conductor brown
- 4) Phase "B" (ungrounded) conductor orange
- 5) Phase "C" (ungrounded) conductor yellow

3.2.5.4 Use lubricant recommended by cable manufacturer, or wire pulling compound specified, to decrease friction when pulling wire and cable through conduit.

3.2.5.5 Do not install or handle wires with thermoplastic insulation or jacket when ambient temperature is 15 F or below.

3.2.6 Splices, Taps, and Cable Terminations: Use plastic insulating tape for uninsulated splices and taps. Apply tape to thickness at least equal to conductor insulation. Where bolted splice or connection presents irregular surface, apply insulating putty to joints before taping.

3.2.7 Motor - Operated Equipment: Connect pumps, valves, etc in accordance with the Drawings, this Section and manufacturer's instructions: Install wiring to devices which do not appear on the Drawings, but are included in installation shown on the manufacturer's drawings.

3.2.8 Field fabricate the Septic Tank Pump Control Panel support structure with framing channel similar to Unistrut to accommodate the control panel, motor terminal box, red beacon light and 6 inch bell. Encase the framing channel base in concrete.

3.2.9 Telecommunication Manholes/Handholes

3.2.9.1 Locate and install manhole/handhole as shown on the Drawings.

3.2.9.2 Replace portions of existing asphalt sidewalks, roadways, and parking lots damaged by excavation with 4 inch depth of asphalt concrete in accordance with Section 02512.

3.2.9.3 Provide 3 cubic foot drain of 1/2 inch crushed gravel below sump in manhole.

3.2.9.4 Excavate and install manhole/handhole in accordance with manufacturer's recommendations.

3.3 FIELD QUALITY CONTROL

3.3.1 Testing, General

3.3.1.1 Test equipment and wiring for continuity and unintentional grounds, and verify proper phase sequence and voltage at equipment served before attempt is made to operate equipment. Notify KEH before start of tests. Correct items found, during testing or examination by KEH, to be at variance with the Drawings and this Section.

3.3.1.2 Furnish instruments, labor, and equipment required to conduct testing.

3.3.1.3 Use test instruments which bear valid calibration stamp showing date of calibration and expiration date of stamp. Calibration and accuracy of test instruments shall be certified by independent testing laboratory having standards traceable to the National Institute of Standards and Technology.

3.3.1.4 Document test results and deliver to KEH.

3.3.1.5 In addition to testing specified to be performed by Contractor, installation will be subject to examination by KEH for conformance with design and applicable codes. Assist KEH as requested.

3.3.2 Motors

3.3.2.1 Check for correct rotation.

3.3.2.2 Measure and record voltage (current), and verify value agrees with data on nameplate.

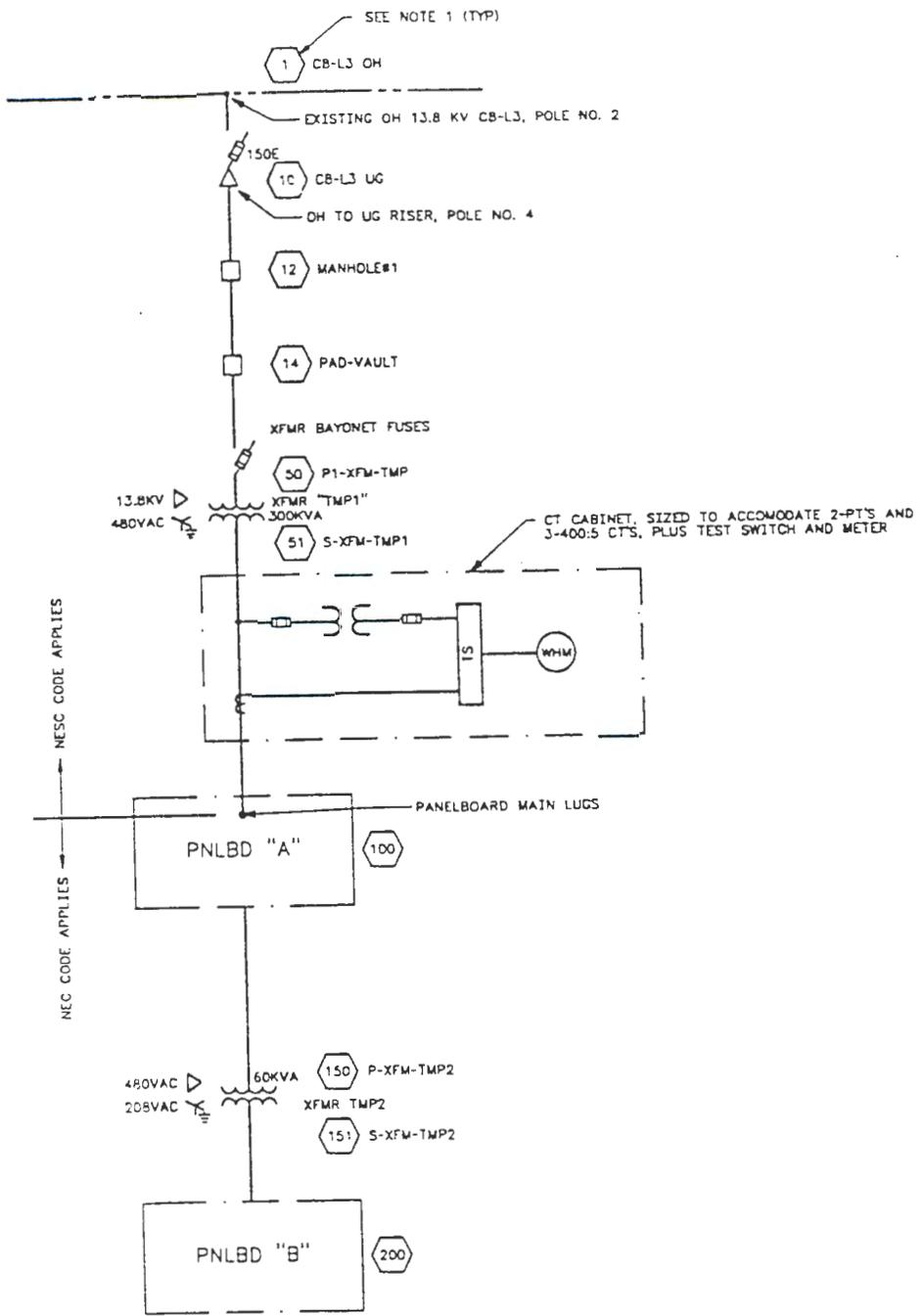
3.3.3 Wiring Systems

3.3.3.1 Megger conductors rated 600 volts and used for services, feeders or branch circuits over 150 volts to ground, phase-to-phase, and phase-to-ground. Minimum acceptable value of insulation resistance is 200 megohms. Megger manufacturer's instruction pamphlet, furnished with megger, shall provide instructions for conducting tests. Disconnect devices not capable of withstanding voltage or current of megger test, such as indicating instruments, relays and lamps, before test is made. Voltage output of megger shall be 1000V dc, nominal.

3.3.3.2 Test wiring operating less than 150 volts to ground for continuity and unintentional grounds. Resistance shall not exceed one ohm on continuity checks.

3.3.3.3 Contractor may elect to group and connect together conductors within raceway while performing megger test. Record readings which indicate less than minimum acceptable value. Repeat megger test after replacement of defective wiring.

3.3.3.4 Reconnect devices disconnected during testing.



Panel Schedule 100 PNLBD "A" 3 Phase 4 Wire Voltage LL: 480 Voltage LG: 277

DC Devices: BREAKERS		Device Family: BOLT-ON		Mounting: SURFACE		Enclosure: NEMA 3R		Comments: MOUNTED ON STRUT		Bus Rating: 400		Available Fault Duty: 6225 A 3 Phase				
Ckt No	Description/Location	#Load Type	Criteria Ea Qty Den	Total VA	Remarks	Device P Amps	Device H Amps	Device P Amps	Device H Amps	Remarks	Total VA	#Load Type	Criteria Ea Qty Den	Description/Location	Ckt No	
1	MAIN BREAKER				TMB	400	3	A	100	2	22000	RCPT		3	WELDING RECEPTACLE	2
3	MAIN BREAKER				W/CKT#1			B			22000	RCPT		3	WELDING RECEPTACLE	4
5	MAIN BREAKER				W/CKT#1			C			22000	RCPT		3	WELDING RECEPTACLE	6
7	SSP-XFM-TMP2	BUS#	150	15000	TMB	90	3	A	1					SPACE	8	
9	SSP-XFM-TMP2	BUS#	150	15000	W/CKT#7			B	1					SPACE	10	
11	SSP-XFM-TMP2	BUS#	150	15000	W/CKT#7			C	1					SPACE	12	
13	SPACE							A	1					SPACE	14	
15	SPACE							B	1					SPACE	16	
17	SPACE							C	1					SPACE	18	
19	SPACE							A	1					SPACE	20	
21	SPACE							B	1					SPACE	22	
23	SPACE							C	1					SPACE	24	
25	SPACE							A	1					SPACE	26	
27	SPACE							B	1					SPACE	28	
29	SPACE							C	1					SPACE	30	

ENCLOSURE LOADS: PHASE A VA 22000. PHASE B VA 22000. PHASE C VA 22000.
 TOTAL LOADS: CONNECTED KVA 110.8 DEMAND KVA 82.8 DESIGN KVA 82.8
 CONNECTED FLA 133.2 DEMAND FLA 99.6 DESIGN FLA 99.6

NOTE: PANELBOARD SHOULD BE SIMILAR TO A SQUARE "D" TYPE "I-LINE" WITH A TYPE "LA" MAIN BREAKER AND "FA" BRANCH BREAKERS. UL LISTED INTERRUPTING RATING OF PANELBOARD AND BREAKERS SHALL BE A MINIMUM OF 14,000A SYM.

Panel Schedule 200 PNLBD "B" 3 Phase 4 Wire Voltage LL: 208 Voltage LG: 120

DC Devices: BREAKERS		Device Family: BOLT-ON		Mounting: SURFACE		Enclosure: NEMA 3R		Comments: MOUNTED ON STRUT		Bus Rating: 225		Available Fault Duty: 3126 A 3 Phase				
Ckt No	Description/Location	#Load Type	Criteria Ea Qty Den	Total VA	Remarks	Device P Amps	Device H Amps	Device P Amps	Device H Amps	Remarks	Total VA	#Load Type	Criteria Ea Qty Den	Description/Location	Ckt No	
1	MAIN BREAKER				TMB	225	3	A	100	2	7500			1	ARE NO. 1	2
3	MAIN BREAKER				W/CKT#1			B			7500			1	SPARE NO. 1	4
5	MAIN BREAKER				W/CKT#1			C	100	2	7500			1	SPARE NO. 6	6
7	SPACE							A			7500			1	SPARE NO. 6	8
9	SPARE NO. 9		1	7500	TMB	100	2	B						SPACE	10	
11	SPARE NO. 9		1	7500	W/CKT#9			C						SPACE	12	
13	SPACE							A	1					SPACE	14	
15	SPACE							B	1					SPACE	16	
17	SPACE							C	1					SPACE	18	
19	SPACE							A	1					SPACE	20	
21	SPACE							B	1					SPACE	22	
23	SPACE							C	1					SPACE	24	
25	SPACE							A	1					SPACE	26	
27	SPACE							B	1					SPACE	28	
29	SPACE							C	1					SPACE	30	

ENCLOSURE LOADS: PHASE A VA 15000. PHASE B VA 15000. PHASE C VA 15000.
 TOTAL LOADS: CONNECTED KVA 45.0 DEMAND KVA 45.0 DESIGN KVA 45.0
 CONNECTED FLA 124.9 DEMAND FLA 124.9 DESIGN FLA 124.9

NOTE: PANELBOARD SHOULD BE SIMILAR TO A SQUARE "D" TYPE "MOOD" WITH A TYPE "LA" MAIN BREAKER AND "OD" BRANCH BREAKERS. UL LISTED INTERRUPTING RATING OF PANELBOARD AND BREAKERS SHALL BE A MINIMUM OF 10,000A SYM.

FEEDER SCHEDULE

FEEDER NO	ROUTING	FEEDER VOLTAGE	RACEWAY QTY DESCRIPTION	FEEDER DESCRIPTION QTY SIZE INSUL GRND	FDR LENGTH
FROM	1 CB-L3	13800.			
TO	10 CB-L3 UG	EX	(0)	(3) 1/0 A ACSR	633
FROM	10 CB-L3 UG	13800.			
TO	12 MANHOLE#1	EX	(0)	(3) 2/0 C UNSH	490
FROM	12 MANHOLE#1	13800.			
TO	14 PAD-VAULT	EX	(0)	(3) 2/0 C UNSH	80
FROM	14 PAD-VAULT	13800.			
TO	50 P-XFM-TMP	EX	(0)	(3) 2/0 C UNSH	10
FROM	51 S-XFM-TMP	480.			
TO	100 PNLBD "A"		(2) 3" C	(4) 350 C XHHW 2	20
FROM	100 PNLBD "A"	480.			
TO	150 P-XFM-TMP2		(1) 1 1/4" C	(3) 2 C THWN 6	10
FROM	151 S-XFM-TMP2	208.			
TO	200 PNLBD "B"		(1) 2 1/2" C	(4) 4/0 C XHHW 4	10

U.S. DEPARTMENT OF ENERGY
 RICHLAND OPERATIONS OFFICE
 KAISER ENGINEERS HANFORD COMPANY

ELECTRICAL
 TEMPORARY POWER
 ONE LINE, SCHED & DETAILS

W-011H WASTE SAMPLG & CHARG FACIL

REV 1
 DESCRIPTION
 REV BY
 DATE
 REV APPROVALS
 DATE

REVISIONS

CAS FILE
 ESO11HA
 LOAD CODE
 2J 12V ACC2:10,000N

DATE
 1/25/61

NO
 42661

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