REG-1280
Revision 0

Independent Qualified Registered Professional Engineer Installation Assessment Report for Integrated Disposal Facility (IDF) Leachate Transfer Pipeline

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

U.S. DEPARTMENT OF ENERGY | Richland Operations Office

P.O. Box 550
Richland, Washington 99352

Approved for Public Release;
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Independent Qualified Registered Professional Engineer Installation Assessment Report for Integrated Disposal Facility (IDF) Leachate Transfer Pipeline

A. A. Marshall
Central Plateau Cleanup Company LLC (CPCC)

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Independent Qualified Registered Professional Engineer Installation Assessment Report

For

Integrated Disposal Facility (IDF) Leachate Transfer Pipeline

IQRPE Installation Assessment Report No. IA-332610-01 Rev. 0

Prepared By:

Meier ARCHITECTURE • ENGINEERING
12 W. Kennewick Ave.
Kennewick, WA 99336

At the request of:

DGR GRANT CONSTRUCTION
Richland, Washington 99352

For:

CH2MHILL Plateau Remediation Company
Richland, Washington 99352

Meier Project No. 20-8692
DGR Grant Construction Contract No. 332610
CHPRC Contract No. 72435

December 9, 2020

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1.0 INTRODUCTION

Meier Architecture • Engineering (Meier) is the Independent Qualified Registered Professional Engineer (IQRPE) of record for this Project and has prepared this IQRPE Installation Assessment Report at the request of DGR Grant Construction (DGR) for CH2MHILL Plateau Remediation Company (CHPRC), the tank system operator.

The Washington Administrative Code (WAC) 173-303, *Dangerous Waste Regulations,* provide a set of requirements for owner/operators of dangerous waste systems. The IDF Infrastructure Upgrades Leachate Transfer Pipeline falls under the requirements of WAC 173-303-640(3) *Design and Installation of New Tank Systems or Components*. Thus, CHPRC requires an IQRPE assessment for new waste handling equipment, to meet WAC 173-303-640(3). This IQRPE Installation Assessment Report is prepared for CHPRC for a new tank system and components in accordance with WAC 173-303-640(3) before it is covered, enclosed, or placed in use.

The IQRPE is responsible to provide the tank system installation assessment certifications in accordance with the requirements of WAC 173-303-810(13)(a), *Certification*.

IP-332610-01, *Independent Qualified Registered Professional Engineer Inspection Plan for IDF Infrastructure Upgrades*, identifies the IQRPE inspections required for procurement, fabrication, inspection, testing, and installation for the IDF Infrastructure Upgrades Project.

A separate Design Assessment Report was prepared by the IQRPE to certify that the proposed IDF Infrastructure Upgrades Leachate Transfer Pipeline has sufficient structural integrity and is acceptable for storing and treating dangerous waste, and that the tank system was adequately designed to ensure it will not collapse, rupture, or fail per the requirements of WAC 173-303-640(3).

This Installation Assessment Report and a separate DA-332610-01, *Independent Qualified Registered Professional Engineer Design Assessment Report for IDF Leachate Transfer Pipeline,* meet the IQRPE certification requirements of WAC 173-303-640(3).

The IQRPE maintains "independence" at all times. However, comments by others are considered by the IQRPE during the preparation of reports and plans. Only the IQRPE can implement changes to the master IQRPE documents.

1.1 PROJECT DESCRIPTION

1.1.1 Background

The scope of this work is to prepare the IDF Facility for the disposal of Immobilized Low-Level Waste (ILAW) from the Waste Treatment Plant (WTP). Additionally, the IDF will receive low-level waste and mixed low-level waste from various Hanford site operations. The IDF is located on the Hanford Site in the 200 East Area.

The new leachate transfer pipeline system is included as part of a tank system under WAC 173-303-640(3). For new tank systems and components, an integrity assessment must be performed to

conform to the requirements found in WAC-173-303-640(3) certified by an IQRPE in accordance with WAC-173-303-810(13)(a).

This installation assessment covers the procurement, fabrication and installation of the new high-density polyethylene (HDPE) encased transfer pipeline, 219-3”-LT-052-HDPE. This new transfer pipeline connects the two (2) landfill cells via the two (2) Leachate Transfer Buildings to both leachate tanks, allowing for transfer leachate to either of the two (2) tanks. In addition, four (4) leachate transfer sumps are located along the new transfer pipeline to provide leak detection.

The following IDF Infrastructure Upgrades Project components listed below are being reviewed for design, procurement, fabrication, and installation:

- Leachate transfer pipeline 219-3”-LT-052-HDPE (ECR-18-001801, *IDF Leachate Tank 219A201 and 219E201 Connection,* page 10 and 11).
- Leachate transfer sumps (ECR-18-001801, page 10, 11 and 12):
  - LTS-1
  - LTS-2
  - LTS-3
  - LTS-4

The transfer pipeline and sump installations for the IDF Infrastructure Upgrades occurred in the 200 East Area of the Hanford Nuclear Site.

1.1.2 IQRPE Scope

Meier provided an IQRPE with supporting Independent Qualified Installation Inspectors (IQII) to perform the design and installation assessments per CHPRC Statement of Work (SOW) 332610, *IDF Infrastructure Upgrades – Leachate Tank Domes*. The task includes review of the design, procurement, fabrication, testing, and installation activities for the IDF Infrastructure Upgrades Project.

For this assessment, design, fabrication, and installation for the components are listed below:

- Leachate transfer pipeline 219-3”-LT-052-HDPE (ECR-18-001801, page 10 and 11).
- Leachate transfer sumps (ECR-18-001801, page 10, 11, and 12):
  - LTS-1
  - LTS-2
  - LTS-3
  - LTS-4

The following figures show the general layout of the project location, infrastructure, equipment layout, and other pertinent details:

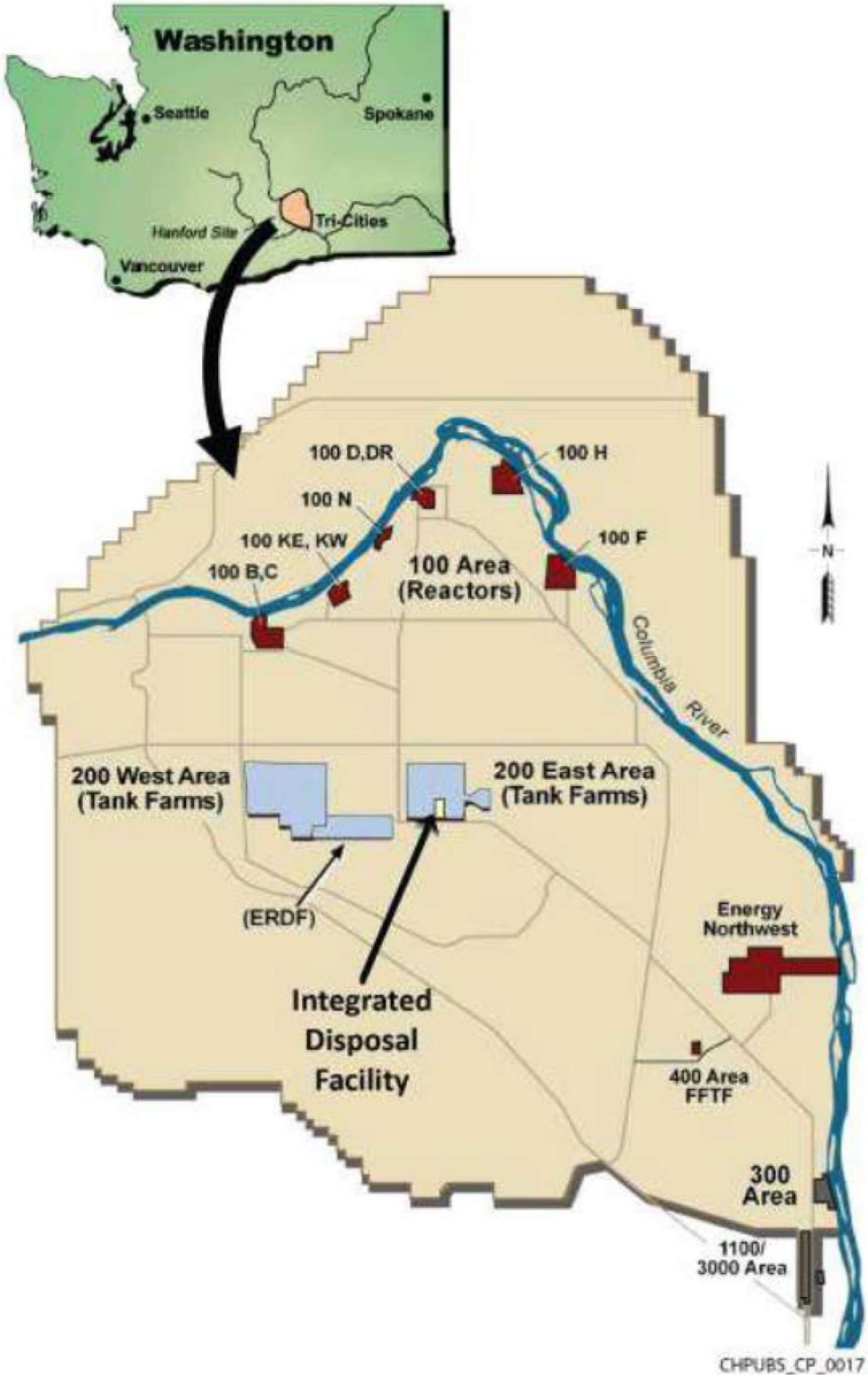


Figure 1: Location of the Integrated Disposal Facility on the Hanford Site (CHPRC-03789)

Figure 2: Current Aerial View of Integrated Disposal Facility (Washington River Protection Solutions, Issue 553, Dec. 1, 2020)

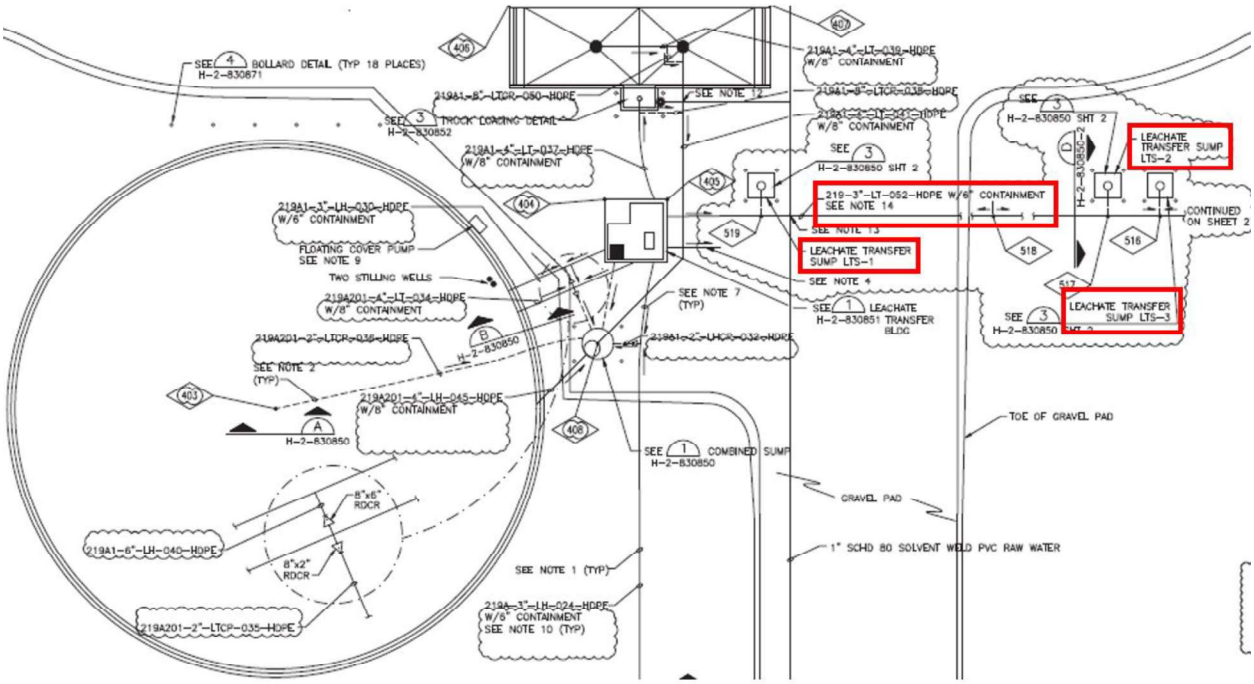


Figure 3: Leachate Transfer Pipeline and Sump Locations (Drawing: ECR-18-001801, Sheet 10)

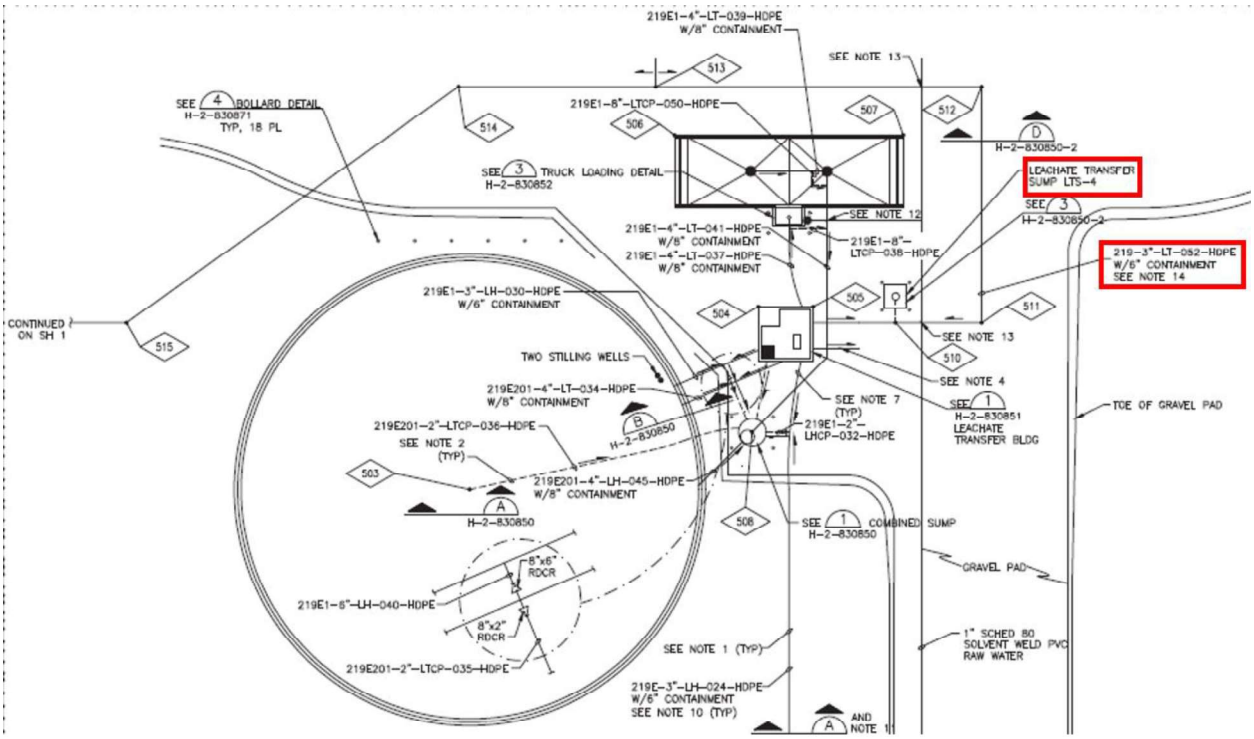


Figure 4: Leachate Transfer Pipeline and Sump Locations (Drawing: ECR-18-001801, Sheet 11)

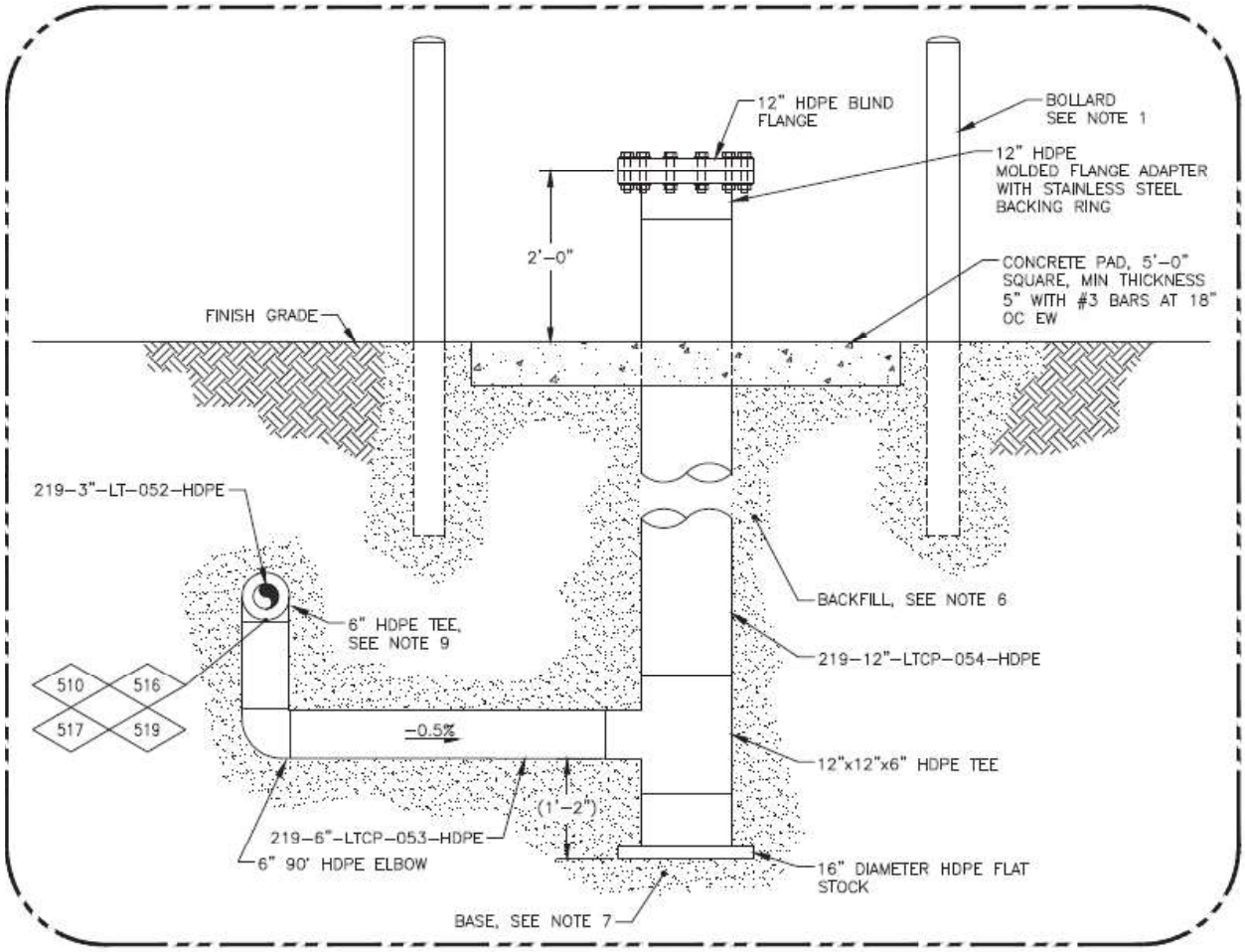


Figure 5: Leachate Transfer Pipeline Sump Detail (Drawing: ECR-18-001801, Sheet 12)

1.2 PURPOSE

Many of the components required for the transfer of dangerous or mixed waste are regulated by WAC 173-303-640(3) requirements. The WAC code requires that the IQRPE prepare an Installation Assessment Report for these components.

This Installation Assessment Report is prepared for DGR and CHPRC by an IQRPE to certify that the IDF Leachate Transfer Pipeline, including the consideration of secondary containment design features, was correctly fabricated, inspected, tested, and installed, and meets the requirements of WAC 173-303-640(3).

1.3 SCOPE OF IQRPE INSTALLATION ASSESSMENT

This installation assessment satisfies dangerous waste regulations which require an IQRPE to inspect a new tank system or component(s) before it is covered, enclosed, or placed into use per the requirements of WAC 173-303-640(3). The IQRPE is responsible to provide the tank system installation assessment certifications in accordance with the requirements of WAC 173-303-810(13)(a).

The scope for this inspection certification requires that the IQII or professional engineer has completed the procurement, fabrication, inspection, testing, and installation oversight activities for the IDF Leachate Transfer Pipeline equipment.

The review and inspection activities determined that the components did not have any observable damage and verified that the correct materials and procedures were used during procurement, fabrication, inspection, testing, and installation. Inspections during installation were performed with the guidance of IP-332610-01.

IP-332610-01 identified three (3) different types of inspections to be performed as part of the IQRPE work scope associated with the IDF Infrastructure Upgrades Project. These included inspections covering:

- Procurement oversight and review activities.
- Fabrication oversight and review activities.
- Installation oversight and review activities.

The individual inspections for each of these categories are detailed below along with the assigned number of Meier IQRPE Inspection Reports used to perform and document the actual inspection results.

Within the collection of completed Inspection Reports, included as Attachment A, is documentation which includes the five (5) IQRPE Inspection Reports along with any relevant supporting documentation and photographs. Each of the Inspection Reports include an approval signature by the IQRPE in accordance with WAC 173-303-810(13)(a).

The IDF Infrastructure Upgrades Project components listed below were installed and certified as fit-for-use under this Installation Assessment Report:

- Leachate transfer pipeline 219-3”-LT-052-HDPE (ECR-18-001801, page 10 and 11).
- Leachate transfer sumps (ECR-18-001801, page 10, 11 and 12):
  - LTS-1
  - LTS-2
  - LTS-3
  - LTS-4

1.3.1 Portions of the IDF Leachate Transfer Pipeline Included in the Scope for IQRPE Certification

Procurement oversight and document review activities were identified in IP-332610-01 for the IQRPE IDF Leachate Transfer Pipeline equipment. Table 1, Table 2, and Table 3 contain a list of the IQRPE Inspection Reports completed to support these IQRPE inspection activities.

The design and installation configuration was reviewed for design changes as documented by change notices (e.g., Field Change Notices [FCNs], Design Change Notices [DCNs], or Engineering Change Notices [ECNs] within the WAC scopes) and these are all addressed in DA-332610-01.

1.3.2 Portions of the IDF Leachate Transfer Pipeline Equipment Not Included in the Scope for IQRPE Certification

This IQRPE Installation Assessment Report was limited only to the IDF Leachate Transfer Pipeline equipment. No other systems or components were evaluated.

A cathodic protection system was not required by CHPRC in the IQRPE IDF Leachate Transfer Pipeline equipment design, and a corrosion protection system is not part of this inspection certification which includes only the procurement, fabrication, inspection, testing, and installation associated with the IQRPE IDF Leachate Transfer Pipeline equipment.

2.0 ASSESSMENTS

The IQRPE observed and assessed the inspection, testing, and installation of the IDF Leachate Transfer Pipeline equipment to support the IQRPE installation certification.

The design configuration was reviewed for design changes as documented by change notices (e.g. FCNs, DCNs, or ECNs within the WAC scope), and these are all included in DA-332610-01.

The completed IQRPE Inspection Reports are attached to this Installation Assessment Report in Appendix A. The WAC 173-303-640(3)(h) require that the IQRPE Inspection Reports and the IQRPE certification statements, as required by WAC 173-303-810(13)(a), be included in the Operating Record and kept at the facility.

2.1 PROCUREMENT

Procurement Oversight and Document Review - IQRPE Inspections:

Procurement oversight and document review activities were identified in IP-332610-01 for the IDF Infrastructure Upgrades Project equipment. The inspections listed below in Table 1 detail the oversight and review of documentation for the procurement, fabrication, inspection, testing, receipt, and storage of the IDF Leachate Transfer Pipeline equipment as specified in the IQRPE Inspection Plan. The design standards for each of the components were also required to be reviewed against all relevant fabrication and testing records. The documents reviewed as part of the inspections (as applicable) include:

- Purchase specifications
- Fabrication records
- Test results
- Material records
- Shop travelers
- Non-Conformance Reports (NCRs)

Table 1: Procurement Oversight and Document Review

Inspection Report No.	Component Inspected	Summary	Inspection Plan Requirement
IR-332610-002	IDF: HDPE Transfer Line: 219-3”-LT-052-HDPE w/6” Containment	Summary, Results, and Conclusions: Inspection Requirements: • Review documentation for procurement, fabrication, inspection, testing, receipt and storage of the leachate transfer pipeline. Inspection Results: Integrated Disposal Facility: • 3” Leachate transfer pipeline: - 219-3”-LT-052-HDPE w/6” containment: o Reviewed the design standards, fabrication and testing records for the leachate transfer pipeline, against the procurement requirements. o No Non-Conformance Reports (NCRs) were generated during the procurement of the leachate transfer pipeline.	Table 1 IP-332610-01, Rev. 0

Table 1: Procurement Oversight and Document Review

Inspection Report No.	Component Inspected	Summary	Inspection Plan Requirement
		Based on the review of the documentation for the leachate transfer pipeline, no discrepancies were found. See attached selection of reference documents. All documents reviewed were acceptable.	
IR-332610-003	IDF: Sump Assemblies: • LTS-1 • LTS-2 • LTS-3 • LTS-4	Summary, Results, and Conclusions: Inspection Requirements: • Review documentation for procurement, fabrication, inspection, testing, receipt and storage of the leachate transfer pipeline sumps. Inspection Results: Integrated Disposal Facility: • Leachate transfer pipeline sumps: - LTS-1. - LTS-2. - LTS-3 - LTS-4. o Reviewed the design standards, fabrication and testing records for the leachate transfer pipeline sumps, against the procurement requirements. o No Non-Conformance Reports (NCRs) were generated during the procurement of the leachate transfer pipeline sumps. Based on the review of the documentation for the leachate transfer pipeline sumps, no discrepancies were found. See attached selection of reference documents. All documents reviewed were acceptable.	Table 1 IP-332610-01, Rev. 0

2.2 FABRICATION

Fabrication Oversight and Review - IQRPE Inspections:

Fabrication oversight and review activities were identified in the IQRPE Inspection Plan IP-332610-01 for the IDF Infrastructure Upgrades Project equipment. The Inspection Reports listed below in Table 2 detail the review of fabrication and testing oversight of the IDF Leachate Transfer Pipeline equipment inspections as specified in IP-332610-01.

Table 2: Fabrication Oversight and Document Review

Inspection Report No.	Component Inspected	Summary	Inspection Plan Requirement
Fabrication of equipment for the IDF Leachate Transfer Pipeline is not included in this scope of work.			

2.3 INSTALLATION

Installation Oversight and Review - IQRPE Inspections:

Installation oversight and review activities were identified in the IQRPE Inspection Plan IP-332610-01 for the IDF Infrastructure Upgrades Project equipment.

The inspections listed below in Table 3 detail the oversight and review of documentation for the installation of the IDF Leachate Transfer Pipeline equipment as specified in the IQRPE Inspection Plan. These record document system tightness after installation and prior to service.

As specified in IP-332610-01, Table 3, IDF Leachate Transfer Pipeline equipment was visually inspected during installation for the following items:

- Punctures
- Scrapes of protective coatings
- Cracks
- Corrosion
- Other structural damage, or damage due to inadequate construction/installation

Table 3: Installation Oversight and Document Review

Inspection Report No.	Component Inspected	Summary	Inspection Plan Requirement
IR-332610-006	IDF: HDPE Transfer Line: 219-3”-LT-052-HDPE	Summary, Results, and Conclusions: Inspection Requirements: • Observe the installation of the leachate transfer lines and sump assemblies. • Review the fuse welding procedures. Inspection Results:	Table 3 IP-332610-01, Rev. A

Table 3: Installation Oversight and Document Review

Inspection Report No.	Component Inspected	Summary	Inspection Plan Requirement
	w/6" Containment Sump Assemblies: • LTS-1 • LTS-2 • LTS-3 • LTS-4	Integrated Disposal Facility: • Leachate transfer pipeline: - 219-3"-LT-052-HDPE w/6 encasement: • Leachate transfer pipeline sumps: - LTS-1. - LTS-2. - LTS-3 - LTS-4. o Reviewed the work steps in Work Order CS-19-07224-K WCN-2. o Reviewed the Bonding Procedure Specification HDPE-02 Rev 0. o Reviewed the Bonder Qualifications for James Connell. o Pressure was regulated at 150 ft lbs. utilizing a calibrated torque wrench (id TMC-150-04 Cal due 9/29/2021). o Bond temperature was monitored with a calibrated laser Thermometer (id TMC-TI-26 Cal due 6/17/2021). o Observed the bonding of the following HDPE 6" pipe: ▪ LTS-1. Bond 54 pipe 6 HB. ▪ LTS-2. Bond 55 pipe 7 HB. ▪ LTS-3. Bond 56 pipe 8 HB. ▪ LTS-4. Bond 57 pipe 9 HB. o All bonding was observed to be completed per bonding procedure HDPE-02 rev 0. o • No Non-Conformance Reports (NCRs) were generated during the fuse welding of the listed pipe and sump assemblies. Based on the witness of the welding and review of the documentation, no discrepancies were found.	

Table 3: Installation Oversight and Document Review

Inspection Report No.	Component Inspected	Summary	Inspection Plan Requirement
		See attached selection of the reference documents and photographs. All documents reviewed were acceptable.	
IR-332610-007	IDF: HDPE Transfer Line: 219-3”-LT-052-HDPE w/6” Containment Sump Assemblies: • LTS-1 • LTS-2 • LTS-3 • LTS-4	Summary, Results, and Conclusions: Inspection Requirements: • Observe the hydrostatic testing of the primary leachate transfer line. Inspection Results: Integrated Disposal Facility: • Leachate transfer pipeline: - 219-3”-LT-052-HDPE w/6 encasement: o Reviewed the work steps in “Test Plan Order of Precedence”. o Observed the test setup which utilized a calibrated test pressure gauge (id TMC-300-07 Cal due 8/20/2021). o The 4-hour initial expansion pressure was not witnessed. o Observed the test pressure at 76 psig. o Observed the test duration at 1 hour. The pressure remained within the test requirement of +/-3.75 psi. o Observed the test personnel check for leaks of the secondary HDPE pipe • No Non-Conformance Reports (NCRs) were generated during the hydrostatic testing of the primary leachate transfer line assembly. Based on the witness of the testing and review of the documentation, no discrepancies were found. See attached selection of the reference documents and photographs. All documents reviewed were acceptable.	Table 3 IP-332610-01, Rev. A

Table 3: Installation Oversight and Document Review

Inspection Report No.	Component Inspected	Summary	Inspection Plan Requirement
IR-332610-008	IDF: HDPE Transfer Line: 219-3”-LT-052-HDPE w/6” Containment Sump Assemblies: • LTS-1 • LTS-2 • LTS-3 • LTS-4	Summary, Results, and Conclusions: Inspection Requirements: • Observe the pneumatic testing of the leachate transfer line secondary containment. Inspection Results: Integrated Disposal Facility: • Leachate transfer pipeline: - 219-3”-LT-052-HDPE w/6 encasement: o Reviewed the work steps in Test Plan Order of Precedence. o Observed the test setup which utilized a calibrated test pressure gauge (id TMC-200-13 Cal due 8/11/2021). o Observed the pneumatic test pressure at 3.6 psi. o Observed the test duration at 13 minutes. o Observed the test personnel check for leaks of the secondary HDPE pipe. o No leaks were detected. • No Non-Conformance Reports (NCRs) were generated during the pneumatic testing of the leachate transfer line secondary containment assembly. Based on the witness of the testing and review of the documentation, no discrepancies were found. See attached selection of the reference documents and photographs. All documents reviewed were acceptable.	Table 3 IP-332610-01, Rev. A

3.0 NON-CONFORMING ITEMS DURING INSTALLATION

No NCRs were written against the IDF Leachate Transfer Pipeline components during fabrication, testing, or installation.

4.0 EXCEPTIONS

There are no documented exceptions identified during the fabrication, inspection, testing, and installation of the IDF Leachate Transfer Pipeline equipment.

5.0 QUALIFIED ENGINEERS AND INSPECTORS

A listing of the IQRPE, Professional Engineers, other engineers, and IQIIs who participated in the preparation of this Installation Assessment Report is provided below:

Independent Qualified Registered Professional Engineers

Paul M. Giever
- P.E., Structural Engineering, License No. 28084

Professional Engineers

Alexander P. Butterfield
- P.E., Mechanical Engineering, License No. 52255

Michel J. Langevin
- P.E., Mechanical Engineering, License No. 23759

BS Degreed Engineer

Nathaniel R. Weinman

- E.I.T., Mechanical Engineering, Enrollment Number E-11818

Independent Qualified Installation Inspectors

Weld Inspectors

James R. Miller

Randy A. Saworski

Installation Inspectors

James R. Miller

Randy A. Saworski

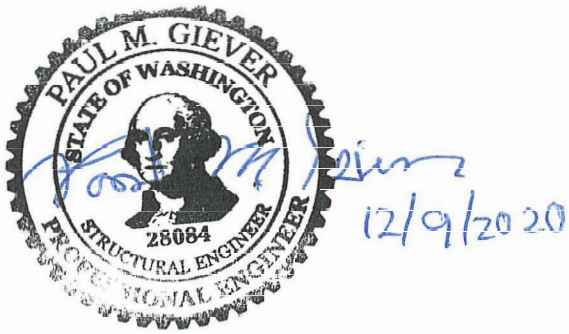
6.0 INSTALLATION REVIEW ASSESSMENT CERTIFICATION

The installation of the IQRPE IDF Leachate Transfer Pipeline equipment, as identified in Section 1.3 of this Installation Assessment Report, has been reviewed by the IQRPE. System installation, based on the data and premises provided in this Installation Assessment Report, are in compliance with WAC 173-303-640(3), as applicable, have sufficient structural integrity, and are Fit-For-Use and acceptable for the transfer of dangerous waste. The certification below is in accordance with the requirements of WAC 173-303-810(13)(a).

WAC 173-303-810(13)(a)

> *I certify under penalty of the law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Report Reviewed by:



Paul M. Giever, SE
Independent Qualified Registered Professional Engineer

December 9, 2020
Date

7.0 REFERENCES

CHPRC-03789, 2019, *Functional Design Criteria Integrated Disposal Facility Infrastructure*, Rev. 2, CH2MHILL Plateau Remediation Company, Richland, Washington.

DA-332610-01, 2020, *Independent Qualified Registered Professional Engineer Design Assessment Report for IDF Leachate Transfer Pipeline*, Rev. 0, Meier Architecture • Engineering, Kennewick, Washington.

ECR-18-001801, 2020, *IDF Leachate Tank 219A201 and 219E201 Connection*, Rev. 0, CH2MHILL Plateau Remediation Company, Richland, WA.

IP-332610-01, 2020, *Independent Qualified Registered Professional Engineer Inspection Plan for IDF Infrastructure Upgrades*, Rev. 0, Meier Architecture • Engineering, Kennewick, Washington.

Statement of Work (SOW) No. 332610, 2020, *IDF Infrastructure Upgrades – Leachate Tank Domes*, Rev. 0, CH2MHILL Plateau Remediation Company, Richland, Washington.

WAC 173-303, "*Dangerous Waste Regulations*," Washington Administrative Code, as amended.

WAC 173-303-640(3), "*Design and Installation of New Tank Systems or Components*," Washington Administrative Code, as amended.

WAC 173-303-810(13)(a), "*Certification*," Washington Administrative Code, as amended.

ATTACHMENT A: IDF Leachate Transfer Pipeline –

IQRPE Inspection Reports

(5 Reports – 97 pages)

Inspection No.: IR-332610-002	Meier Project No. 8692	Project Title: IDF Upgrades

Inspection Description: Procurement Report – 3" Leachate Transfer Pipeline (219-3"-LT-052-HDPE w/6" Containment)

Contract No.:	332610

Components or System Inspected:

Integrated Disposal Facility:

- 3" Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6" containment.

Inspector:	Alexander P. Butterfield	Date and Time:	12/8/2020	N/A

Reference Documents	Rev No.	Reference Documents	Rev No.
ECR-18-001801, *IDF Leachate Tank 219A201 and 219E201 Connection*, Page 10 & 11.	00	CHPRC-03953, *IDF Infrastructure Construction Specifications*, CHPRC.	0
Vendor Submittal: 71806-000-SUB-174-001, *Product Data – PE Pressure Pipe & Tubing*, CHPRC.	03	IP-332610-01, Table 1.	0

Background and Objective: Review vendor submittal documentation for the procurement, fabrication, inspection, testing, receipt and storage of the following equipment:

Integrated Disposal Facility:

- 3" Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6" containment.

Items checked below were inspected to ensure compliance with the requirements of 40 CFR 265 Subpart J "Tank Systems" and WAC 173-303-640 "Tanks Systems" to treat and store dangerous waste. WA Ecology Guide 94-114, "Guidance for Assessing and Certifying Tank Systems" is used for reference only.

Inspection Criteria ☐ Existing Tank System ☒ New Tank System	CFR 265.191 Existing	CFR 265.192 New	WAC Existing Tank Systems	WAC New Tank Systems	Ecology Guide 94-114
☒ Document Review					
☒ Other: Review procurement documentation for the leachate transfer pipeline.					
☐ Weld breaks		(b)(1)		(3)(c)(i)	4.1
☐ Punctures		(b)(2)		(3)(c)(ii)	4.1
☐ Scrapes of protective coatings		(b)(3)		(3)(c)(iii)	4.1
☐ Cracks		(b)(4)		(3)(c)(iv)	4.1
☐ Corrosion	(b)(3)	(b)(5)		(3)(c)(v)	4.1
☐ Other structural damage or inadequate construction / installation	(a),(b)	(b)(6)		(3)(c)(vi)	4.1
☐ Placement of reinforcing steel and anchor bolts					4.1

☐ Concrete placement					4.1
☐ Subgrade and foundation preparation					4.1
☐ Placement of shop-fabricated tanks					4.1
☐ Erection of field-erected tanks					4.1
☐ Installation of secondary containment liner or vault					4.1
☐ Installation of piping, pumping, and other ancillary equipment					4.1
☐ Placement and compaction of backfill				(3)(d)	4.1
☐ Visual inspection/leak tightness/ pressure testing	(b)(5)		(2)(c)(v)	(3)(e)	4.1/4.2
☐ Ancillary equipment support and protection	(b)(1)			(3)(f)	3.5
☐ Corrosion protection systems	(b)(3)		(2)(c)(iii)	(3)(g)	4.3

Contacts Made During Inspection		
Name	Title	Company
N/A	N/A	N/A

Summary, Results, and Conclusions:

Inspection Requirements:

- Review documentation for procurement, fabrication, inspection, testing, receipt and storage of the leachate transfer pipeline.

Inspection Results:

Integrated Disposal Facility:

- 3" Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6" containment:
    - Reviewed the design standards, fabrication and testing records for the leachate transfer pipeline, against the procurement requirements.
    - No Non-Conformance Reports (NCRs) were generated during the procurement of the leachate transfer pipeline.

Based on the review of the documentation for the leachate transfer pipeline, no discrepancies were found. See attached selection of reference documents.

All documents reviewed were acceptable.

QII Signature	12/9/20 Date	IQRPE Signature	12/9/2020 Date
QII Print Name: Alexander P. Butterfield		IQRPE Print Name: Paul Giever	

This page contains contract-specific information that was removed.

CHPRC CONTRACTOR DOCUMENT SUBMITTAL FORM

(1) PROJECT NO.	(2) CONTRACT NO./RELEASE NO.	(3) SUBMITTAL REGISTER NO.	(4) VERSION	(5) DATE PREPARED
IDF Infrastructure Upgrades	71806-000	174	3	6/18/2020

(6) CONTRACTOR: Intermech, Inc.

SIGNATURE Grace Johnson DATE: 6/18/2020

(7) TO: PROJECT RECORDS SPECIALIST MSIN: Phone: 509- -

RECEIVED BY E-mail: FAX: 509- -

PROJECT RECORDS SPECIALIST: _____ DATE: _____

(8) QTY/ E	(9) DOCUMENT NUMBER	(10) REV	(11) No. of pgs	(12) FORMAT (DWG, MFC, P3, GEN, PDF)	(13) TITLE / DESCRIPTION	(14) APPROVAL TYPE (AP, APW)	(15) ASSOCIATED SPEC OR SOW REF. NO.	(16) CHPRC REVIEW STATUS A	B	B	C
N/A	71806-000-SUB-174-001	03	15	PDF	Product Data - PE Pressure Pipe & Tubing	APW	33 05 33.23				

(17) SUBCONTRACTOR REMARKS (If this is a re-submittal to a previously approved submittal then explain why it is being re-submitted here.)

(18) REVIEWER DISTRIBUTION (HARD OR ELECTRONIC)

NAME	NAME	NAME

(19) CHPRC DOCUMENT APPROVER(S)	(20) DUE DATE BACK TO APPROVER(S)	(21) DUE DATE TO CONTRACTOR

(22) SUMMARY OF COMMENTS (IF ANY)

(23) BTR CONCURRENCE/APPROVAL: (NAME / SIGNATURE / DATE)

/ /

(24) PROJECT RECORDS SPECIALIST: [ ] Submittal Version Complete
[ ] Partial Complete

PROJECT RECORDS SPECIALIST _____ DATE: _____

(25) SUBMITTAL FORMAT: (USED IN BLOCK 12)

- DWG = AutoCad
- GEN = Contractor's Format
- MFC = Microsoft Format Compatible
- P3 = Primavera Schedule
- PDF = Adobe Acrobat (Portable Document Format)
- HC = Hard Copy

(26) SUBMITTAL APPROVAL TYPE: (USED IN BLOCK 14)

- APW = Approval Required Prior to Work
- AP = Approval Required

(27) SUBMITTAL REVIEW STATUS: (USED IN BLOCK 16)

- A Conforms to the Contract Requirements
- B NO-No resubmit. Minor Comments. Approved with exceptions as corrected.
- B YES-Resubmit. Minor Comments. Approved to proceed; however resubmittal is required.
- C Revise and Resubmit

HIGH COUNTRY FUSION
A Division of CONSOLIDATED PIPE & SUPPLY COMPANY, INC
20 North Poly Fusion Place
PO Box 509
Fairfield, Idaho 83327 USA
+1-208-764-2000 ISO9001:2015 certified
+1-208-764-2094 fax www.hcfusion.com or www.consolidatedpipe.com

Specifications and Material Standards for Fabricated HDPE Fittings Made of PE 4710 Material by High Country Fusion

Materials:

1. The pipe shall be made from polyethylene resin compound with a minimum cell classification of PE 445474C for PE 4710 materials in accordance with ASTM D 3350. This material shall have a Long Term Hydrostatic Strength of 2000 PSI when tested in accordance to ASTM D2837, and shall be a PPI (Plastic Pipe Institute) listed material. Pipe dimensions with be in accordance with ASTM F714 as a minimum.
2. AWWA C906- NSF Pipe used for AWWA C-906 Fittings.

Reference and testing Specifications:

1. ASTM F714: Standard Specification for Polyethylene Plastic Pipe (SDR-PR). Based on outside diameter.
2. ASTM F2206: Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene Plastic Pipe, Fittings, Sheet Stock, Plate Stock or Block Stock.
3. ASTM D3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
4. ASTM D3035: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR.) Based on Controlled Outside Diameter.
5. ASTM D3261: Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
6. ASTM F2880: Standard Specification for Lap-Joint Flange Adapters for Polyethylene Pressure Pipe in Nominal Pipe Sizes ¾" to 65 in.
7. ASTM F3123: Standard Specification for Metric Outside Diameter Polyethylene (PE) Plastic Pipe (DR-PN)
8. ASTM F3190: Standard Practice for Heat Fusion Equipment (HFE) Operator Qualification on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings.
9. ASTM F3124: Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints in Plastic Piping Systems or Fittings.
10. ASME B31.3 – A328.2.5- Bonder Qualification
11. ASTM F2620: Standard practice for heat fusion joining of polyethylene pipe and fittings
12. PPI (Plastic Pipe Institute) TR-33 Butt Fusion Joining Procedures.
13. PPI (Plastic Pipe Institute) TR-41 Saddle Fusion Joining Procedures.

Organizational References:

-Member of PPI (Plastic Pipe Institute) Technical Advisory Board for M & I Division. Member PPI since 2000.
-ASTM Membership- Plastic Pipe F17 Committee member.
-Distributor Member of the Alliance for PE Pipe – Responsible Infrastructure

ISO 9001 Certification:

Products are manufactured by High Country Fusion Company in Fairfield Idaho USA, which is certified to ISO 9001 (Quality Management System) by PJR.

Note – HCFC may choose to refer to the above standards to provide the best possible HDPE products. If your requirements specify the conformance of any specifications listed or not listed, these must be requested before receiving a quotation and may be subject to an additional cost.

1. GENERAL

1.1 The contractor shall install a high density polyethylene (HDPE) dual containment pipe system as shown on the drawings. The contractor is responsible for installation and testing of a complete and operational piping system. This specification shall govern the materials and installation of the pipe, fittings and structures.

2. REFERENCES

The following publications listed form a part of this specification to the extent referenced. References to publications in the text are by basic designation only.

2.1 American Society for Testing and Materials (ASTM)

2.1.1 ASTM D 2774-04, Underground Installation of Thermoplastic Pressure *Pipe*.
2.1.2 ASTM F 2620, Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
2.1.3 ASTM D 3350, Specification for Polyethylene Pipe and Fittings.
2.1.4 ASTM F 714 Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
2.1.5 ASTM F 2164, Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
2.1.6 ASTM D 3035, Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
2.1.7. ASTM D- 2837, Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Design Basis for Thermoplastic Pipe Products.
2.1.8 ASTM D-2657, Heat Fusion Joining of Polyolefin Pipe and Fittings.

2.2 Other Publications

2.2.1 AWWA C 901, Polyethylene Pressure Pipe, Tubing and Fittings ½” through 3” for Water.
2.2.2 AWWA C 906, Polyethylene (PE) Pressure Pipe and Fittings, 4” through 63”, for Water Distribution.
2.2.3PPI, TR-33, Generic Butt Fusion Procedures
2.2.4 PPI, Chapter 5, Handbook of PE Pipe, Specifications, Test Methods and Codes
2.2.5 PPI, Chapter 7, Handbook of PE Pipe, Installation of Underground Pipe
(PPI Documents are available at www.Plasticpipe.org)

3. SUBMITTALS- Contractor Submittals

3.1 Documentation of the pipe system supplier's experience with pre-assembled dual containment piping systems.

3.2 Detailed fabrication drawings of all fittings and special structures.

3.3 Pressure test results: Contractor shall submit report (s) summarizing the results of pressure testing. These report (s) shall list the sections of pipe tested, the test pressure at the beginning and end of the test, the ambient air temperature, and results of a visual test.

4.0 PRODUCTS

4.1 PIPE AND FITTINGS DESIGN

4.1.1 All pipe burial and pressure system design is governed by the pipe design and installation methods covered in PPI Handbook of PE Pipe.

4.1.2 The pipe system shall be designed for the following conditions: The carrier and containment pipes shall have wall comparable wall thicknesses within 20% of each other so the pipes can be heated and joined properly for simultaneous fusion. See Appendix 'A'.

4.1.3 The pipe used in fabrication of this system shall meet the specification of ASTM-D3350 with a minimum cell classification of 455474C / PE 4710 / PE100. The fittings either molded or fabricated must be made from material that meets this same specification.

4.1.4 All pipe and fittings shall meet the pressure requirements of the system as specified and in ASTM D-2837, Thermoplastic Design Basis and ASTM F-2206, Fabricated fittings of Butt Fused PE Pipe, Fittings, Sheet Stock, Plate Stock or Block Stock.

4.2 DUAL CONTAINMENT PIPE SYSTEM

4.2.1 The dual containment pipe system shall consist of pre-assembled HDPE carrier and containment pipe, end spacers, centralizers, and single dog-bone ends.

4.2.2 The dual containment fittings shall consist of pre-assembled HDPE carrier and containment pipe with centralizers. (Some fitting configurations may require the use of dog-bone ends to assure proper simultaneous fusion)

4.2.3 Centralizers will be manufactured or fabricated from Polyethylene or Polypropylene materials that mechanically connect to the carrier pipe OD in a way that they will not slip during installation of the carrier pipe into the containment pipe. The OD of the centralizers shall match the ID of the containment pipe as closely as possible.

4.2.4 Pipe supplied under this specification shall have IPS (Iron Pipe Size) outside diameter (OD) and shall meet either ASTM F-714 or ASTM D-3035.

4.2.5 Fittings shall be manufactured to the same pressure rating and OD as the pipe.

4.2.6 Pipe joints and fittings shall be supplied to the job site ready for simultaneous butt fusion. The fabricator shall show that the materials are capable of butt fusion and shall provide a procedure to consistently produce sound welds.

4.2.7 End termination fittings shall be used to seal the system at the ends. The fitting shall be simultaneously butt fused to the carrier and containment pipe to seal the annular space. No other closure or termination will be allowed. This fitting will also provide transition to single wall piping.

4.2.8 Tie-ins to other piping systems and/or equipment, where butt fusion is not

applicable, shall be with HDPE flange-adapters unless otherwise specified in the drawings. Mechanical or clamp type fittings are not allowed under this specification.

4.2.9 Experience of manufacturer shall not be less than 5 years of manufacturing and production of dual contained piping and related fittings.

4.2.10 The dual containment piping system shall be the Simal-Fuse system manufactured by High Country Fusion Co. (1-800-780-6330) or approved equal.

5. EXECUTION

5.1 Contractor shall verify the locations of all potentially conflicting utilities and structures as indicated on the drawings.

5.2 Dual containment pipe and fittings shall be pre-assembled prior to shipment to the job site. Pre-assembly shall consist of pipe sections with centralizers, casing spacers as per drawings and a minimum on one factory installed dog-bone end.

5.3. Pipe shall be stored on a clean, level, dry ground. If the pipe must be stacked for storage, such stacking should be done in accordance with the pipe suppliers recommendations. The handling of the pipe should be done in such a manner that the pipe is not damaged by dragging over sharp objects or cut by lifting equipment.

5.4. Segments of pipe having cuts or gouges in excess of 10% of the wall thickness, shall not be incorporated into the system.

5.5 Sections of HDPE dual containment pipe shall be joined into continuous lengths on the job site following the guidelines of ASTM D-2657, using the simultaneous butt fusion method of joining the pipe.

5.6 The butt fusion equipment used by the contractor to join the pipe and fittings shall be manufactured by McElroy Manufacturing, Tulsa, OK or approved equal. A method of recording and documentation of assured quality fusion and pipe fusion parameters, including time, temperature, and pressure for each fusion made must be done must be used. This can be accomplished either electronically by using a fusion machine equipped with the McElroy Datalogger[a] type recording devise or using an engineer approved manual method. Each fusion joint should be recorded / documented.

5.7 A representative of the dual containment pipe fabricator shall be on site to train the contractor's personnel. Only the system supplier or those personnel trained by the system supplier are approved to perform simultaneous dual containment welds.

5.8 Fused segments of pipe shall be handled with the pipe system supplier's recommendations. Bending of the pipe during installation shall be limited and shall not exceed the pipe system supplier's recommendations.

5.9 Modification to the system will only be done by a representative of the dual containment pipe fabricator or a trained installer approved by the pipe fabricator.

5.8 Installation of the pipe in the ground should be accomplished following the procedures outlines in PPI Handbook of Polyethylene Pipe, Chapter 7, Installation of Underground Pipe.

6. SYSTEM TESTS

6.1 The carrier and containment pipe shall be subjected to both a pressure test and a visual test. Testing shall be the responsibility of the contractor. The test may be witnessed by the owner. The owner shall be notified at least 3 days in advance of such tests. The final test report shall be delivered to the owner and, the dual containment pipe supplier, within 30 days of the test.

6.2 Pressure Test: After the pipe has been installed, fusion completed, and the trench partially backfilled (leaving the joints exposed for examination), the carrier pipe shall be filled with water in a manner to expel all air. The pipeline shall be subjected to a test pressure of 1.2 (PE 4710 design pressure) times the systems operating pressure for a period of a least 1 hour. The test time should not exceed 3 hours. Add and measure the amount of make-up water required to return to the test pressure and compare this with the maximum allowances stated in PPI, Handbook of Polyethylene Pipe, Chapter 2, Inspections, Tests and Safety Considerations. If the carrier pipe is for gravity service only, the “Containment Pipe Testing” can be performed on the carrier pipe as well. This is per ASTM F 2164, except the test pressure has been reduced from 1.5 to 1.2 based on ISO standards and the new higher pressure rating of HDPE pipe for the same SDR.

6.3 Containment Pipe Testing: The carrier pipe shall be brought up to and held at the system test pressure while the containment pipe is leak tested. Air pressure of no higher than 5 psi shall be used to pressurize the containment pipe. Extreme caution should be used to insure that the annular space is not over pressurized. Air is a compressible gas and is very dangerous. Always build and release pressure slowly. The test period shall not exceed 10 minutes. The pipe shall be brought up to test pressure and held for 10 minutes or until the pressure stabilizes. The test shall begin when the pressure stabilizes and lasts for 5 minutes. If no significant pressure drop is noted, the pipe has passed the test.

6.4 Retesting: If any deficiencies are revealed during the test, such deficiencies shall be corrected. The tests shall be re-conducted until the results of the tests are within specified allowances with no additional cost to the owner.

6.5 Visual Test: All exposed joints, fittings, and valves shall be examined for leaks. Visible leaks shall be stopped and/or the defective pipe, fitting, joint, or valve shall be replaced.

7. CLEANUP

Upon completion of the installation of the HDPE piping system, all debris and surplus materials resulting from the work shall be removed from the site and disposed of by the contractor.

APPENDIX –'A'

DESIGN CRITERIA – DUAL CONTAINED PIPING SYSTEMS

SIMULTANEOUS FUSED – DOUBLE CONTAINMENT HDPE PIPING SYSTEMS CRITICAL SDR / WALL THICKNESS DESIGN CRITERIA AND ANNULAR SPACE

Carrier Pipe (inner pipe) and Containment Pipe (outer pipe) should have wall thicknesses that are ***within 20%*** of each other to be able to be fused simultaneously with the highest acceptable level of confidence that the proper fusion can be made. (Prime acceptance range) (See examples below)

EXAMPLES OF WALL THICKNESS DIFFERENCE

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	10.75	6.625	WALL DIFFERENCE	0.104
SDR	17	9	% THE SAME	86%
WALL	0.632	0.736	Annular Difference per Side	1.430
AVG ID OF PIPE	9.43	5.09		

In the example left, the 10" IPS DR 17 and the 6" IPS DR 9 are within 14% of each other in wall thickness. This application **would be acceptable** for a simultaneous fusion system.

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	10.75	6.625	WALL DIFFERENCE	0.323
SDR	26	9	% THE SAME	56%
WALL	0.413	0.736	Annular Difference per Side	1.649
AVG ID OF PIPE	9.89	5.09		

In the example left, the 10" IPS DR 26 and the 6" IPS DR 9 are 44% different of each other in wall thickness. This application **is outside the prime acceptance range** for a simultaneous fusion system

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	12.75	8.625	WALL DIFFERENCE	0.034
SDR	17	11	% THE SAME	96%
WALL	0.750	0.784	Annular Difference per Side	1.313
AVG ID OF PIPE	11.19	6.99		

In the example left, the 12" IPS DR 17 and the 8" IPS DR 11 are within 4% of each other in wall thickness. This application **would be very good** for a simultaneous fusion system.

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	3.5	1.315	WALL DIFFERENCE	-0.086
SDR	17	11	% THE SAME	172%
WALL	0.206	0.120	Annular Difference per Side	0.887
AVG ID OF PIPE	3.07	1.07		

In the example left, the 3" IPS DR 17 and the 1" IPS DR 11 are 72% different of each other in wall thickness. This application **is outside the prime acceptance range** for a simultaneous fusion system.

PAGE 2, DCS Design Criteria

An easy formula for determining if the pipe you want to use is within the pirce acceptance range:

Average Wall Thickness = (OD ÷ SDR) X 1.04

Take one wall thickness and divide it by the other, if the range is within 20% of each other (+20% or -20% from 100%) then these are acceptable pipes and SDR's. i.e.:

12.75 ÷ 17= .75 (12" IPS SDR 17)
.75 X 1.04 = .78 (average wall)

8.625 ÷ 11=.784 (8" IPS SDR 11)
.784 X 1.04=.815 (average wall)

.784 ÷ .815 = .957

1 - .957 = .043 or 4.3%

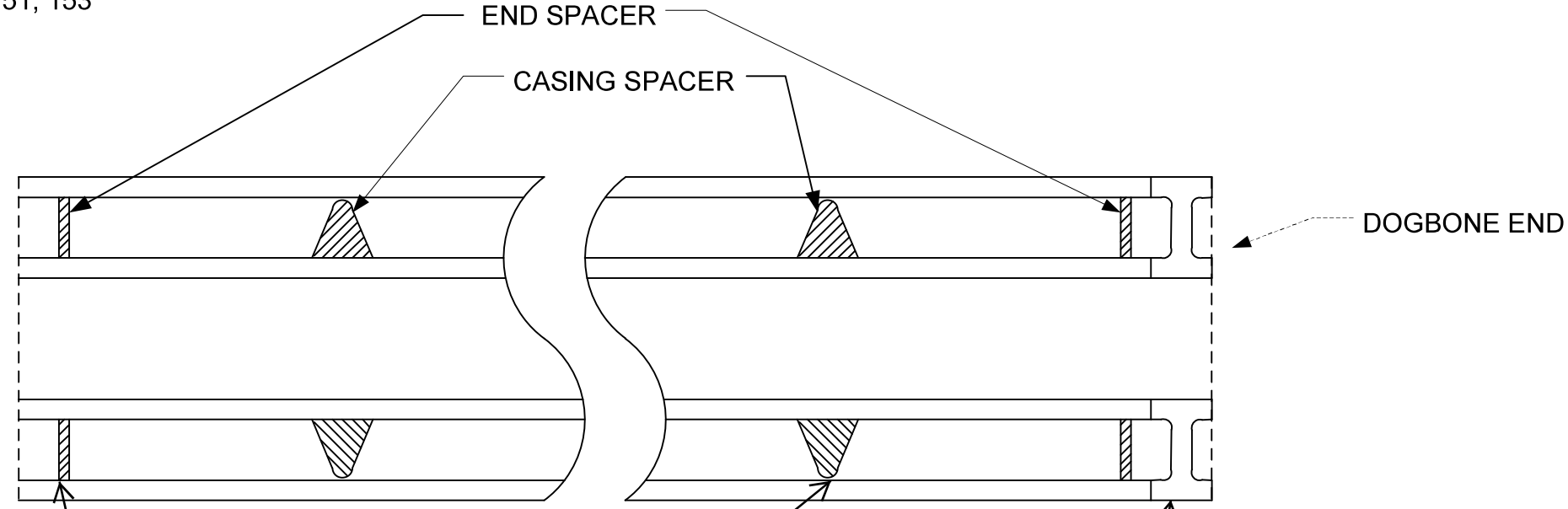
It is possible to manufacture Simal-Fuse Dual containment piping systems that fall outside of the 20% range recommended. These systems simply increase the chances of fusion problems during installation.

Annular Space:

It is important that there is enough annular space between the OD of the inner pipe and the ID of the outer pipe to be able to fuse both pipes without the melt beads running into each other and creating sealed sections of pipe. Here is a chart with size to size recommendations. Note wall thickness difference must still be calculated to confirm pipe can be simultaneously fused.

Containment Pipe	X	Carrier Pipe	IPS Size
3.500	X	1.315	3 x 1
3.500	X	1.660	3 x 1 1/4
3.500	X	1.900	3 x 1 1/2
4.500	X	2.375	4 x 2
6.625	X	3.500	6 x 3
6.625	X	4.500	6 x 4
8.625	X	4.500	8 x 4
10.750	X	6.625	10 x 6
12.750	X	8.625	12 x 8
14.000	X	10.750	14 x 10
16.000	X	10.750	16 x 10
18.000	X	12.750	18 x 12
18.000	X	14.000	18 x 14
20.000	X	16.000	20 x 16

LINE 151, 153



Casing Spacers are used that keep the pipe with 1/4" of each other.

VARIABLE LENGTH UP TO 50' WITH CASING INSULATORS NO MORE THAN 8' APART

End spacers are machined to exactly center the carrier pipe so that all Simal-Fusions are accurately done. If the pipe needs to be shortened, these can be inserted at the cut and re-center the carrier pipe.

Dogbone ends are factory welded to both pipes to physically lock them together so the pipe cannot slip during fusion.

h Country Fusion Inc
Fairfield, ID 83327
(208) 764-2000
(208) 764-2094 (fax)

HIGH COUNTRY FUSION COMPANY INC

Date: 1/29/09	Drawing: DCS SNGL DOGBONE
Revised:	

Created By: WW
IR-332610-002

SPECIFICATIONS

Effective April, 2016
Supercedes January, 2014
1830 Centennial Ave.
Hastings, NE 68901
Ph: 402-462-2227
Fax: 402-462-5529
Toll Free: 866-851-2227
centennialplastics.com

Centennial PLASTICS, INC.

CenFuse

HDPE 4710 — ASTM D3035

- Flexible polyethylene pipe
- Produced from only the finest virgin material
- Backed by a **50-YEAR WARRANTY**
- All diameters are IPS, OD controlled and compatible with heat fusion.

ASTM D3035		3/4"	1"	1-1/4"	1-1/2"	2"	3"	4"	6"
125 PSI	SDR 17								
	O.D.	1.050"	1.315"	1.660"	1.900"	2.375"	3.500"	4.500"	6.625"
	I.D.	.926"	1.161"	1.464"	1.676"	2.095"	3.088"	3.970"	5.971"
	Wall	.062"	.077"	.098"	.112"	.140"	.206"	.265"	.390"
	Wt/Ft	.082#	.128#	.206#	.269#	.421#	.912#	1.508#	3.268#
	Coil Lengths	Multiple Coil Lengths and Straight Lengths Available Upon Request					500'/1000'	500'	40'
		3/4-2" BY QUOTATION ONLY							
138 PSI	SDR 15.5								
	O.D.	N/A	N/A	1.660"	1.900"	2.375"	3.500"	4.500"	6.625"
	I.D.	N/A	N/A	1.446"	1.654"	2.069"	3.048"	3.920"	5.771"
	Wall	N/A	N/A	.107"	.123"	.153"	.226"	.290"	.427"
	Wt/Ft	N/A	N/A	.223#	.294#	.457#	.994#	1.641#	3.5557#
	Coil Lengths	100-500 ft	100-500 ft	100-500 ft	100-500 ft	100-500 ft	40-500 ft	40 ft	40/20**ft
160 PSI	SDR 13.5								
	O.D.	1.050"	1.315"	1.660"	1.900"	2.375"	3.500"	4.500"	6.625"
	I.D.	.894"	1.121"	1.414"	1.618"	2.023"	2.982"	3.834"	5.643"
	Wall	.078"	.097"	.123"	.141"	.176"	.259"	.333"	.491"
	Wt/Ft	.102#	.159#	.254#	.333#	.520#	1.128#	1.865#	4.048#
	Coil Lengths	Multiple Coil Lengths and Straight Lengths Available Upon Request					500'/1000'	500'	40'
200 PSI	SDR 11								
	O.D.	1.050"	1.315"	1.660"	1.900"	2.375"	3.500"	4.500"	6.625"
	I.D.	.860"	1.077"	1.358"	1.554"	1.943"	2.864"	3.682"	5.421"
	Wall	.095"	.120"	.151"	.173"	.216"	.318"	.409"	.602"
	Wt/Ft	.122#	.191#	.306#	.402#	.627#	1.36#	2.249#	4.873#
	Coil Lengths	Multiple Coil Lengths and Straight Lengths Available Upon Request					500'/1000'	500'	40'
250 PSI	SDR 9								
	O.D.	1.050"	1.315"	1.660"	1.900"	2.375"	3.500"	4.500"	N/A
	I.D.	.818"	1.023"	1.292"	1.478"	1.847"	2.722"	3.500"	N/A
	Wall	.117"	.146"	.184"	.211"	.264"	.389"	.500"	N/A
	Wt/Ft	.146#	.229#	.365#	.479#	.749#	1.626#	2.688#	N/A
	Coil Lengths	Multiple Coil Lengths and Straight Lengths Available Upon Request					500'/1000'	500'	40'

**Straight Lengths
Note: Other coil sizes and/or straight lengths are available upon request.
Note: CenFuse HDPE is suitable for connections by heat fusion or compression fittings of the same SDR

CenFuse meets AWWA C901 requirements in 3/4" - 3", SDR 9, 11 and 13.5
CenFuse meets AWWA C906 requirements in 4" - 6" all SDRs
Centennial Plastics, Inc. is an ISO 9001 Certified Company

NSF *CenFuse is tested and certified to NSF/ANSI Standard 14*
All applicable CenFuse SDR's bear the NSF/ANSI 358-1 Certification Mark.

Product is Certified to NSF/ANSI 372 and conforms with the lead content requirements for "lead free" plumbing as defined by California, Vermont, Maryland, and Louisiana state laws and the U.S. Safe Drinking Water Act.

Centennial PLASTICS, INC.

CENFUSE 4710
HDPE MATERIAL DATA SHEET

CENFUSE 4710 HDPE MEETS OR EXCEEDS:
ASTM D 3035
ASTM D 3350, CELL CLASSIFICATION PE 445576C

CENFUSE 4710 PIPE FOR:
GEOTHERMAL, GROUND SOURCE HEAT PUMP APPLICATIONS.

NOMINAL PIPE PROPERTIES

	ASTM METHOD	ENGLISH UNITS	SI UNITS
DENSITY (BLACK)	D 4883	-	.959 g/cc
MELT INDEX [1]	D 1238	-	8.5 g/10 min
HYDROSTATIC DESIGN BASIS @ (23° C)	D 2837	1600 psi	11.0 MPa
HYDROSTATIC DESIGN BASIS @ (60° C)	D 2837	1000 psi	6.9 MPa
CARBON BLACK CONCENTRATION	D 1603	2.30%	2.30%

NOMINAL RAW MATERIAL PROPERTIES

TENSILE STRENGTH			
@ YIELD (2 in/min)	D 638	3625 psi	25.0 MPa
@ BREAK (2 in/min)	D 638	5500 psi	38.0 MPa
ELONGATION			
@ BREAK (2 in/min)	D 638	>600%	>600%
FLEXURAL MODULUS [2]	D 790	150,000 psi	1,035 MPa
NOTCHED IZOD IMPACT STRENGTH	D 256	9.0 ft-lbf/in	0.49 kJ/m
HARDNESS (SHORE D)	D 2240	66	66
VICAT SOFTENING POINT	D 1525	259° F	126° C
BRITTLENESS TEMPERATURE	D 746	<-180° F	<-118° C
ENVIRONMENTAL STRESS CRACK RESISTANCE [3]	D 1693	>5000 hrs.	>5000 hrs.
NOTCH TENSILE (PENT)	F 1473	>10,000 hrs.	>10,000 hrs.
CELL CLASSIFICATION	D 3350	445576C	445576C

[1] 190°C21600 g
[2] 2% Secant-Method 1
[3] Condition C

Available in Size 3/4" - 6"
SDR 9 - 17.

Centennial Plastics is an ISO 9001 certified company.
CenFuse is certified by NSF.
CenFuse meets AWWA C901 and C906 Requirements.
CenFuse HDPE 4710 is certified by NSF Standards 14 and 61.

CENTENNIAL PLASTICS INC. I 1830 CENTENNIAL AVENUE I HASTINGS, NE 68901
PHONE: (866) 851-2227 I FAX: (402) 462-5529
WWW.CENTENNIALPLASTICS.COM

W-751021-A
August 15, 2014

HIGH COUNTRY FUSION A DIVISION OF CONSOLIDATED PIPE & SUPPLY CO. INC.

PRIMARY IPS AND LARGE METRIC SIZES OF PIPE AVAILABLE WORLDWIDE

IPS PIPE SIZES		125 PSI SDR 17			100 PSI SDR 21			80 PSI SDR 26			63 PSI SDR 32.5 **			50 PSI SDR 41 **		
IPS Pipe Size	Nominal OD (in)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)
2"	2.375	0.14	2.084	0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3"	3.500	0.21	3.072	0.94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4"	4.500	0.26	3.949	1.55	0.21	4.054	1.27	NA	NA	NA	NA	NA	NA	NA	NA	NA
5"	5.563	0.33	4.882	2.37	0.26	5.012	1.94	0.21	5.118	1.58	NA	NA	NA	NA	NA	NA
6"	6.625	0.39	5.814	3.36	0.32	5.969	2.75	0.25	6.095	2.24	0.20	6.201	1.77	NA	NA	NA
8"	8.625	0.51	7.570	5.69	0.41	7.771	4.66	0.33	7.935	3.80	0.27	8.073	3.00	NA	NA	NA
10"	10.750	0.63	9.435	8.83	0.51	9.685	7.24	0.41	9.890	5.91	0.33	10.062	4.66	0.26	10.205	3.72
12"	12.750	0.75	11.190	12.43	0.61	11.487	10.19	0.49	11.730	8.31	0.39	11.934	6.56	0.31	12.103	5.23
14"	14.000	0.82	12.287	14.98	0.67	12.613	12.28	0.54	12.880	10.02	0.43	13.104	7.91	0.34	13.290	6.31
16"	16.000	0.94	14.042	19.57	0.76	14.415	16.04	0.62	14.720	13.09	0.49	14.976	10.33	0.39	15.188	8.24
18"	18.000	1.06	15.798	24.77	0.86	16.217	20.30	0.69	16.560	16.57	0.55	16.848	13.07	0.44	17.087	10.43
20"	20.000	1.18	17.553	30.58	0.95	18.019	25.07	0.77	18.400	20.45	0.62	18.720	16.14	0.49	18.985	12.88
22"	22.000	1.29	19.308	37.00	1.05	19.821	30.33	0.85	20.240	24.75	0.68	20.592	19.52	0.54	20.884	15.58
24"	24.000	1.41	21.064	44.03	1.14	21.623	36.10	0.92	22.080	29.45	0.74	22.464	23.24	0.59	22.782	18.54
26"	26.000	1.53	22.819	51.67	1.24	23.425	42.36	1.00	23.920	34.57	0.80	24.336	27.27	0.63	24.681	21.76
28"	28.000	1.65	24.574	59.93	1.33	25.227	49.13	1.08	25.760	40.09	0.86	26.208	31.63	0.68	26.580	25.24
30"	30.000	1.76	26.329	68.80	1.43	27.029	56.40	1.15	27.600	46.02	0.92	28.080	36.31	0.73	28.478	28.97
32"	32.000	1.88	28.085	78.28	1.52	28.830	64.17	1.23	29.440	52.36	0.98	29.952	41.31	0.78	30.377	32.96
34"	34.000	2.00	29.840	88.37	1.62	30.632	72.44	1.31	31.280	59.11	1.05	31.824	46.63	0.83	32.275	37.21
36"	36.000	2.12	31.595	99.07	1.71	32.434	81.21	1.38	33.120	66.27	1.11	33.696	52.28	0.88	34.174	41.72
1000MM	39.250	2.31	34.448	117.76	1.87	35.362	96.54	1.51	36.110	78.77	1.21	36.738	62.15	0.96	37.259	49.59
42"	42.000	2.47	36.861	134.84	2.00	37.840	110.54	1.62	38.640	90.20	1.29	39.312	71.16	1.02	39.869	56.78
48"	48.000	2.82	42.127	176.12	2.29	43.246	144.38	1.85	44.160	117.81	1.48	44.928	92.95	1.17	45.565	74.16
54"	54.000	3.18	47.393	222.90	2.57	48.651	182.73	2.08	49.680	149.10	1.66	50.544	117.63	1.32	51.260	93.86
1400MM*	55.120	3.24	48.376	232.25	2.62	49.660	190.39	2.12	50.710	155.35	1.70	51.592	122.56	1.34	52.324	97.79
1600MM	63.000	3.71	55.292	303.40	3.00	56.760	248.72	2.42	57.960	202.94	1.94	58.968	160.11	1.54	59.804	127.75
1800MM*	70.865	4.17	62.194	383.88	3.37	63.846	314.70	2.73	65.196	256.78	2.18	66.330	202.59	1.73	67.270	161.64
2000MM*	78.740	4.63	69.106	473.94	3.75	70.941	388.52	3.03	72.441	317.02	2.42	73.701	250.11	1.92	74.745	199.56

*- 1400, 1800 AND 2000 MM PIPE IS METRIC AND AVALIABLE FROM A FEW SELECT MANUFACTURERS INSIDE AND OUTSIDE THE USA

**- SDR 32.5 AND SDR 41 PIPE IS VERY THIN WALL VS. DIAMETER AND HAS A TENDENCY TO BECOME OUT OF ROUND DURING SHIPPING AND TRANSPORT.

STANDARD PRODUCTION SIZES- USUALLY STOCKED IN SOME QUANTITIY

PRODUCTION SIZES NOT USUALLY STOCKED BUT RUN TO ORDER

SPECIAL RUN TO ORDER ONLY SIZES

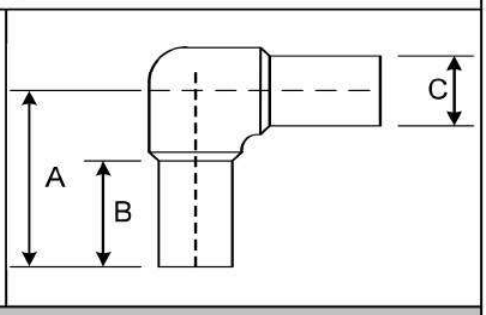
HIGH SPECIALIZED SIZES THAT CAN BE RUN ONLY BY CERTAIN MANUFACTURERS

NOT AVAILABLE AT THIS TIME BECAUSE OF WALL THICKNESS (TOO THICK OR THIN) AND RESIN CONCERNS

MOLDED IPS 90 DEGREE ELBOWS

1/4 BEND

HIGH COUNTRY FUSION COMPANY INC



MOLDED IPS 90 DEGREE ELBOWS

IPS SIZE	A	B	C	SDR	WPR PE3608	WPR PE4710*
3/4"	4.00	2.63	1.050	9,11	200,160	254, 200
1"	4.00	2.63	1.315	9,11	200,160	254, 200
1 1/4"	4.00	2.63	1.660	9,11	200,160	254, 200
1 1/2"	4.00	2.63	1.900	9,11	200,160	254, 200
2"	4.50	2.81	2.375	7,9,11,17	254,200,160,100	336, 254, 200, 128
3"	5.13	3.00	3.500	7,9,11,17	254,200,160,100	336, 254, 200, 128
4"	5.75	3.00	4.500	7,9,11,17	254,200,160,100	336, 254, 200, 128
6"	9.00	4.38	6.625	7,9,11,17	254,200,160,100	336, 254, 200, 128
8"	12.00	6.00	8.625	7,9,11,17	254,200,160,100	336, 254, 200, 128
10"	13.25	6.00	10.750	11,17	160,100	200, 128
12"	15.88	7.50	12.750	11,17	160,100	200, 128

SDR 17

Technical Notes

* Elbows made with PE4710 Material carry these ratings when used in conjunction with PE4710 pipe.
Fully pressure rated for the SDR ordered
Dimensions are in inches
Contact your HCFC representative for a quote
All fittings meet AWWA C906 fitting requirements

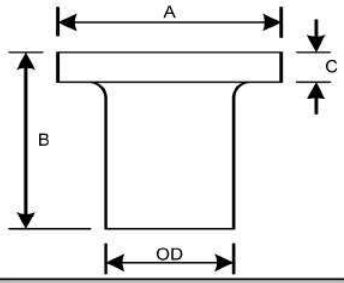
PHONE: 800-780-6330
FAX: 208-764-2094
www.hcfusion.com

B-2

This page contains sensitive vendor information. Contact NUPI Americas for drawing no. EL10013.

MOLDED / MACHINED IPS FLANGE ADAPTERS

HIGH COUNTRY FUSION COMPANY INC



MOLDED / MACHINED IPS FLANGE ADAPTERS

IPS SIZE	TRUE OD	A	B	C	SDR	WPR PE3608	WPR PE4710[7]
3/4"	1.050	1.85	4.02	0.39	11	160	200
1"	1.315	2.36	4.02	0.39	11	160	200
1 1/4"	1.660	2.80	4.02	0.39	11	160	200
1 1/2"	1.900	3.15	4.02	0.39	11	160	200
2"	2.375	3.94	6.00	0.39[4]	7,9,11,17	254,200,160,100	330,250,200,120
3"	3.500	5.00	6.00	0.63[4]	7,9,11,17	254,200,160,100	330,250,200,120
4"	4.500	6.60	6.00	0.54[4]	7,9,11,17	254,200,160,100	330,250,200,120
5"	5.563	7.63	7.75	0.75[4]	7,9,11,17	254,200,160,100	330,250,200,120
6"	6.625	8.50	8.00	0.78[4]	7,9,11,17	254,200,160,100	330,250,200,120
8"	8.625	10.63	11.00	1[4]	7,9,11,17	254,200,160,100	330,250,200,120
10"	10.750	12.75	12.00	1.28[4]	7,9,11,17	254,200,160,100	330,250,200,120
12"	12.750	15.00	12.00	1.54[4]	7,9,11,17	254,200,160,100	330,250,200,120
14"	14.000	17.50	12.00	1.5[4]	7,9,11,17	254,200,160,100	330,250,200,120
16"	16.000	20.00	12.00	1.75[4]	7,9,11,17	254,200,160,100	330,250,200,120
18"	18.000	21.38	12.00	1.88[4]	7,9,11,17	254,200,160,100	330,250,200,120
20"	20.000	23.47	12.00	2.27[4]	7,9,11,17	254,200,160,100	330,250,200,120
22"	22.000	25.60	12.00	2.5[4]	7,9,11,17	254,200,160,100	330,250,200,120
24"	24.000	27.85	12.00	2.82[4]	7,9,11,17	254,200,160,100	330,250,200,120
26"	26.000	30.00	14.00	2.95[6]	11,17,21	160,100,80	200,120,100
28"	28.000	32.30	14.00	3.18[6]	11,17,21	160,100,80	200,120,100
30"	30.000	34.30	14.00	3.40[6]	11,17,21	160,100,80	200,120,100
32"	32.000	36.50	14.00	3.63[6]	11,17,21	160,100,80	200,120,100
34"	34.000	38.50	14.00	3.86[6]	11,17,21	160,100,80	200,120,100
36"	36.000	40.80	14.00	4.10[6]	11,17,21	160,100,80	200,120,100
42"	42.000	47.50	14.00	3.10[9]	17,21,26	100,80,65	120,100,80
48"	48.000	54.00	14.00	2.85[9]	17,21,26	100,80,65	120,100,80
54"	54.000	60.00	14.00	3.21[9]	17,21,26	100,80,65	120,100,80

SDR 17

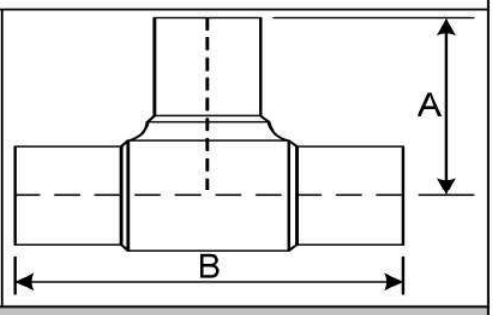
Technical Notes

Dimensions are in Inches
Back up rings sold separately, for dimensions see pg. D-8
For example of how Flange Adapters work with Back up rings see page D-3
[4]=Face thickness is for SDR 11, call for specifics on other SDR's
[6]=Face thickness is for SDR 11, 1.25 x wall thickness
[9]=Face thickness is for SDR 17, 1.25 x wall thickness.
[7]=Pressure ratings apply when using in conjunction with PE4710 pipe.
Other sizes, styles and SDR's not listed are available. Contact your HCFC representative for a quote
Sizes 24" and smaller meet AWWA C906 fitting requirements

PHONE: 800-780-6330
FAX: 208-764-2094
www.hcfusion.com

IPS MOLDED TEES

HIGH COUNTRY FUSION COMPANY INC



IPS MOLDED TEES

IPS SIZE	TRUE OD	A	B	SDR	WPR PE3608	WPR PE4710*
3/4"	1.050	2.50	5.00	11	160	200
1"	1.315	2.73	5.67	11	160	200
1 1/4"	1.660	3.31	6.61	11	160	200
1 1/2"	1.900	4.00	7.99	11	160	200
2"	2.375	4.33	8.66	7,9,11,17	254,200,160,100	336, 250, 200, 160
3"	3.500	5.91	11.81	7,9,11,17	254,200,160,100	336, 250, 200, 160
4"	4.500	6.89	13.78	7,9,11,17	254,200,160,100	336, 250, 200, 160
6"	6.625	9.06	18.11	7,9,11,17	254,200,160,100	336, 250, 200, 160
8"	8.625	11.81	23.62	7,9,11,17	254,200,160,100	336, 250, 200, 160
10"	10.750	13.78	27.56	11,17	160,100	200, 160
12"	12.750	15.79	31.57	11,17	160,100	200, 160

Technical Notes

*=Pressure ratings apply when used in conjunction with PE4710 pipe.
Note: Dimension will vary slightly depending on the manufacturing source.
Dimensions are in Inches
Other sizes and SDR's not listed are available.
Contact your HCFC representative for a quote
All fittings meet AWWA C906 fitting requirements

PHONE: 800-780-6330
FAX: 208-764-2094
www.hcfusion.com

Inspection No.: IR-332610-003	Meier Project No. 8692	Project Title: IDF Upgrades

Inspection Description: Procurement Report – leachate transfer pipeline sumps.

Contract No.:	332610

Components or System Inspected:

Integrated Disposal Facility:

- Leachate transfer pipeline sumps:
  - LTS-1.
  - LTS-2.
  - LTS-3
  - LTS-4.

Inspector:	Alexander P. Butterfield	Date and Time:	12/8/2020	N/A

Reference Documents	Rev No.	Reference Documents	Rev No.
ECR-18-001801, *IDF Leachate Tank 219A201 and 219E201 Connection*, Page 10 & 11.	00	CHPRC-03953, *IDF Infrastructure Construction Specifications*, CHPRC.	0
Vendor Submittal: 71806-000-SUB-178-001, *Product Data – PE Manholes,* CHPRC.	01	Vendor Submittal: 71806-000-SUB-179-001, *Field Verified Fabrication Drawings - Manholes,* CHPRC.	01
IP-332610-01, Table 1.	0		

Background and Objective: Review vendor submittal documentation for the procurement, fabrication, inspection, testing, receipt and storage of the following equipment:

Integrated Disposal Facility:

- Leachate transfer pipeline sumps:
  - LTS-1.
  - LTS-2.
  - LTS-3
  - LTS-4.

Items checked below were inspected to ensure compliance with the requirements of 40 CFR 265 Subpart J "Tank Systems" and WAC 173-303-640 "Tanks Systems" to treat and store dangerous waste. WA Ecology Guide 94-114, "Guidance for Assessing and Certifying Tank Systems" is used for reference only.

Inspection Criteria ☐ Existing Tank System ☒ New Tank System	CFR 265.191 Existing	CFR 265.192 New	WAC Existing Tank Systems	WAC New Tank Systems	Ecology Guide 94-114
☒ Document Review					
☒ Other: Review procurement documentation for the leachate transfer pipeline sumps.					
☐ Weld breaks		(b)(1)		(3)(c)(i)	4.1
☐ Punctures		(b)(2)		(3)(c)(ii)	4.1

☐ Scrapes of protective coatings		(b)(3)		(3)(c)(iii)	4.1
☐ Cracks		(b)(4)		(3)(c)(iv)	4.1
☐ Corrosion	(b)(3)	(b)(5)		(3)(c)(v)	4.1
☐ Other structural damage or inadequate construction / installation	(a),(b)	(b)(6)		(3)(c)(vi)	4.1
☐ Placement of reinforcing steel and anchor bolts					4.1
☐ Concrete placement					4.1
☐ Subgrade and foundation preparation					4.1
☐ Placement of shop-fabricated tanks					4.1
☐ Erection of field-erected tanks					4.1
☐ Installation of secondary containment liner or vault					4.1
☐ Installation of piping, pumping, and other ancillary equipment					4.1
☐ Placement and compaction of backfill				(3)(d)	4.1
☐ Visual inspection/leak tightness/ pressure testing	(b)(5)		(2)(c)(v)	(3)(e)	4.1/4.2
☐ Ancillary equipment support and protection	(b)(1)			(3)(f)	3.5
☐ Corrosion protection systems	(b)(3)		(2)(c)(iii)	(3)(g)	4.3

Contacts Made During Inspection		
Name	Title	Company
N/A	N/A	N/A

Summary, Results, and Conclusions:

Inspection Requirements:

- Review documentation for procurement, fabrication, inspection, testing, receipt and storage of the leachate transfer pipeline sumps.

Inspection Results:

Integrated Disposal Facility:

- Leachate transfer pipeline sumps:
  - LTS-1.
  - LTS-2.
  - LTS-3
  - LTS-4.
    - Reviewed the design standards, fabrication and testing records for the leachate transfer pipeline sumps, against the procurement requirements.
    - No Non-Conformance Reports (NCRs) were generated during the procurement of the leachate transfer pipeline sumps.

Based on the review of the documentation for the leachate transfer pipeline sumps, no discrepancies were found. See attached selection of reference documents.

All documents reviewed were acceptable.

QII Signature	12/9/20 Date	IQRPE Signature	12/9/2020 Date
QII Print Name: Alexander P. Butterfield		IQRPE Print Name: Paul Giever	

This page contains contract-specific information that was removed.

CHPRC CONTRACTOR DOCUMENT SUBMITTAL FORM

(1) PROJECT NO.	(2) CONTRACT NO./RELEASE NO.	(3) SUBMITTAL REGISTER NO.	(4) VERSION	(5) DATE PREPARED
IDF Infrastructure Upgrades	71806-000	178, 179	01	5/27/2020

(6) CONTRACTOR: Intermech, Inc.

SIGNATURE Grace Johnson DATE: 5/27/2020

(7) TO: PROJECT RECORDS SPECIALIST MSIN: Phone: 509- -

RECEIVED BY E-mail: FAX: 509- -

PROJECT RECORDS SPECIALIST: _____ DATE: _____

(8) QTY/ E	(9) DOCUMENT NUMBER	(10) REV	(11) No. of pgs	(12) FORMAT (DWG, MFC, P3, GEN, PDF)	(13) TITLE / DESCRIPTION	(14) APPROVAL TYPE (AP, APW)	(15) ASSOCIATED SPEC OR SOW REF. NO.	(16) CHPRC REVIEW STATUS A	B	B	C
N/A	71806-000-SUB-178-001	01	23	PDF	Product Data - PE Manholes	APW	33 05 75				
N/A	71806-000-SUB-179-001	01	7	PDF	Field Verified Fabrication Drawings - Manholes	APW	33 05 75				

(17) SUBCONTRACTOR REMARKS (If this is a re-submittal to a previously approved submittal then explain why it is being re-submitted here.)

(18) REVIEWER DISTRIBUTION (HARD OR ELECTRONIC)

NAME	NAME	NAME

(19) CHPRC DOCUMENT APPROVER(S)	(20) DUE DATE BACK TO APPROVER(S)	(21) DUE DATE TO CONTRACTOR

(22) SUMMARY OF COMMENTS (IF ANY)

(23) BTR CONCURRENCE/APPROVAL: (NAME / SIGNATURE / DATE)

/ /

(24) PROJECT RECORDS SPECIALIST: [ ] Submittal Version Complete
[ ] Partial Complete

PROJECT RECORDS SPECIALIST _____ DATE: _____

(25) SUBMITTAL FORMAT: (USED IN BLOCK 12)

- DWG = AutoCad
- GEN = Contractor's Format
- MFC = Microsoft Format Compatible
- P3 = Primavera Schedule
- PDF = Adobe Acrobat (Portable Document Format)
- HC = Hard Copy

(26) SUBMITTAL APPROVAL TYPE: (USED IN BLOCK 14)

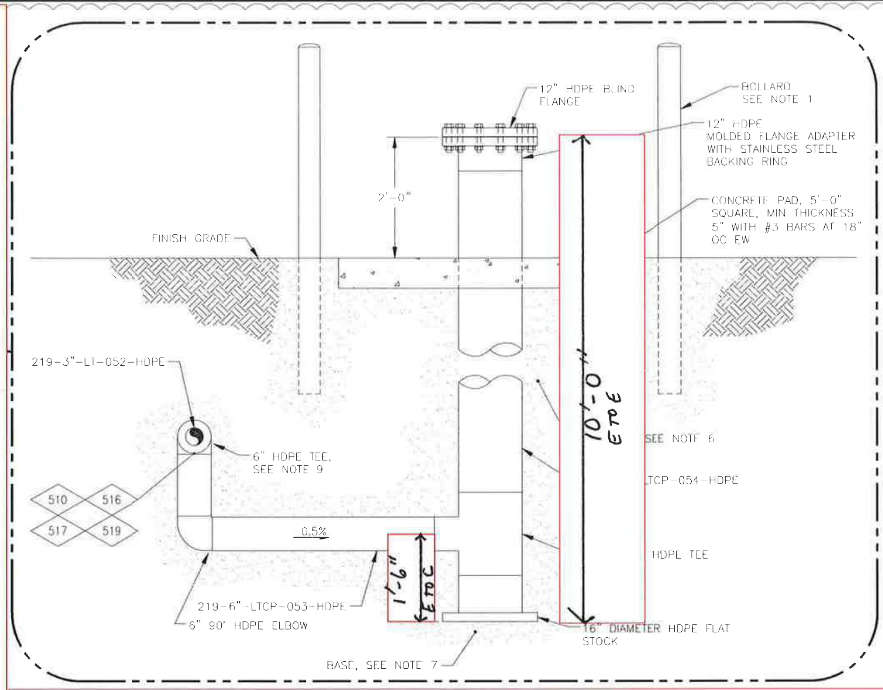
- APW = Approval Required Prior to Work
- AP = Approval Required

(27) SUBMITTAL REVIEW STATUS: (USED IN BLOCK 16)

- A Conforms to the Contract Requirements
- B NO-No resubmit. Minor Comments. Approved with exceptions as corrected.
- B YES-Resubmit. Minor Comments. Approved to proceed; however resubmittal is required.
- C Revise and Resubmit

H.D. FOWLER COMPANY

12" X 10' HDPE SUMP



MADE BY HIGH COUNTRY FUSION

MADE FROM SDR17 PIPE AND FITTINGS WITH 12" X 6" TEE, FLAT STOCK, 12" FLANGE ADAPTER, 316SS BACKING RING, AND HDPE BLIND FLANGE

PRC-03953, SECTION 33.05.33.23 INSTRUCTION SPECIFICATION.

U.S. DEPARTMENT OF ENERGY
Office of River Protection
IDF
LCRS / LDS
SECTIONS AND DETAILS
H-2-830850 0

ADD ECR-18-001801 PAGE 12 SKETCH-004

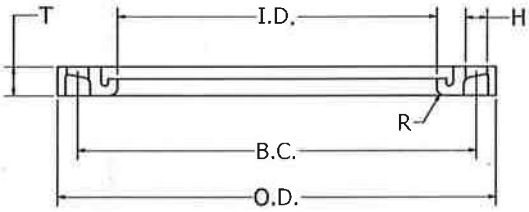
LINE 159

REVISION HISTORY			
REV	DESCRIPTION	DATE	DESIGNER
1	VALID - ORIGINAL DWG	5/5/14	JEREMY GARZA

Material: Stainless Steel ASTM A351CF8M (316), CF8 (304)

Page 1 of 2

Dimensions											
Pipe Diameter (in)	SDR	O.D.	T	I.D.	Bolt Count	Bolt Hole Size (H)	Bolt Hole Circle (BC)	R	Weight (lbs)	Pressure Class (PC)	FM APPROVED
12"	11	19.000	1.250	12.920	12	1.000	17.000	0.420	24.0	200	FM(160psi)



Notes

Improved Piping Products' backing rings and blinds mate with AWWA C207, ANSI B16.5 and ANSI B16.47, as appropriate. Specifications not stated in these standards follow internal specifications.

DRAWN	Matt Graff	8/1/2011
ENG	Ellis Clark	5/22/2013
QA	Teresa matias	5/22/2013
VPOP		

IMPROVED PIPING PRODUCTS, INC.

TITLE: SS-SDR Stainless Steel Flange / Backup Ring Submittal Sheet

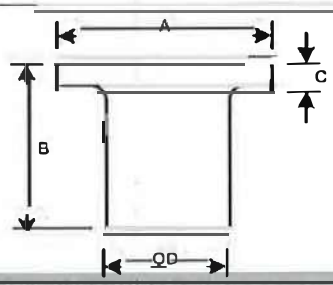
UNLESS OTHERWISE NOTED, ALL DIMENSIONS IN INCHES

SIZE C | PART NO SS-SDR Submittal | SALES NO | SCALE | REV 1 | SHEET 1 OF 2

Ongoing engineering design efforts may affect the technical information listed in our publications.

MOLDED / MACHINED IPS FLANGE ADAPTERS

HIGH COUNTRY FUSION COMPANY INC



MOLDED / MACHINED IPS FLANGE ADAPTERS

IPS SIZE	TRUE OD	A	B	C	SDR	WPR PE3608	WPR PE4710[7]
12"	12.750	15.00	12.00	1.54[4]	7,9,11,17	254,200,160,100	330,250,200,120

Technical Notes

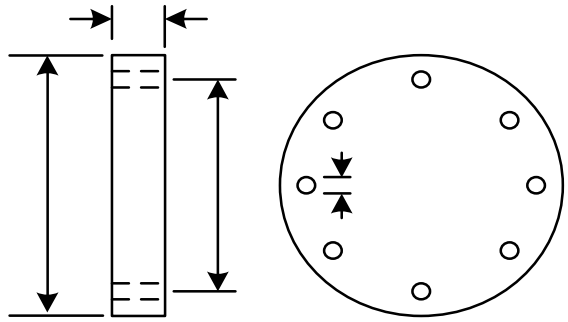
Dimensions are in inches
Back up rings sold separately, for dimensions see pg. D-8
For example of how Flange Adapters work with Back up rings see page D-3
[4]=Face thickness is for SDR 11, call for specifics on other SDR's
[6]=Face thickness is for SDR 11, 1.25 x wall thickness
[8]=Face thickness is for SDR 17, 1.25 x wall thickness.
[7]=Pressure ratings apply when using in conjunction with PE4710 pipe.
Other sizes, styles and SDR's not listed are available. Contact your HCFC representative for a quote
Sizes 24" and smaller meet AWWA C906 fitting requirements

PHONE: 800-780-6330
FAX: 208-764-2094
www.hcfusion.com

HDPE BLIND FLANGES

FOR BOTH IPS AND DIPS PIPE SIZES

HIGH COUNTRY FUSION COMPANY INC



HDPE BLIND FLANGES

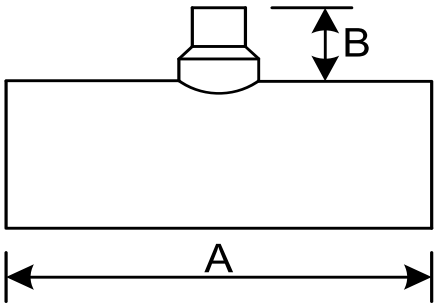
SIZE	OUTSIDE DIAMETER "OD"	BOLT CIRCLE "BC"	THICKNESS "T"	# OF BOLTS "N"	BOLT HOLE DIAMETER "D"
12"	19.00	17.00	1" / 2"	12	1.00

Technical Notes

These blind flanges are ordinarily used for closure or nitecapping of flanged pipes.
They are NOT fully pressure rated
Without the use of a metal back-up blind flange, the HDPE flange may leak between bolt holes at moderate pressures
Dimensions are in Inches

IPS FABRICATED REDUCING TEES

HIGH COUNTRY FUSION COMPANY INC



IPS FABRICATED REDUCING TEES

IPS SIZE	A	B	SDR
12" X 6"	28.00	6.00	9-17

Technical Notes

For Derating factors please refer to derating chart in HDPE Pipe Section. Outlet size and SDR determines if derating occurs

Fittings available in PE 3408 and PE4710.

Fully pressure rated reducing tees are available with outlet sizes 3/4" to 24" IPS.

Other sizes and SDR's not listed are available.

Contact your HCFC representative for a quote

Sizes 24" and smaller meet AWWA C906 fitting requirements.

Dimensions are in Inches

PHONE: 800-780-6330
FAX: 208-764-2094
www.hcfusion.com

16" X 1" FLANGE AT BOTTOM CUT FROM FLAT STOCK HDPE PER THESE SPECIFICATIONS

KING PIPEGRADE®

This massive custom T-section produced by Independent Pipe Products utililizes King PipeGrade® PE 100 material in multiple components of the pipe.

- Made of the finest polymers available, using any of our proprietary K-Stran® process, compression molding or our extrusion molding process.
- Environmentally stabilized for tough and demanding conditions.
- Blocks and slabs available to custom thickness up to 30″ and 96″ width.
- 50-100 years service life per ISO CRS 10 MPa @ 20°C.
- Superior Slow Crack Growth (SCG) resistance.
- High temperature/pressure performance.
- Enhanced fusion to MSPE and other HDPE pipe grades.
- Increased tensile strength and modulus.

The Superior Polymer For The Pipe Industry

King PipeGrade® is a special black polyethylene material is formulated for the pipe industry. It is available in sheets, slabs, and massive shapes.

King PipeGrade® is now offering PE 4710/PE 100 material as our standard, which is compliant to ASTM D3350 as a standard material.

ASTM D3350 covers 4710 PE100 which is completely compatible and 100% interchangeable for use in applications that presently use ASTM 3608 - PE 80 material. PE4710-PE100 tends to have a higher hydrostatic design basis (HDB) than other resins but most significantly is the notched tensile/slow crack PENT test which is >10,000 hours vs.100-200 hours for the others.

Standard Color

Black

Standard Sheet Sizes

1/8″ | 3/16″ | 1/4″ | 3/8″ | 1/2″ | 5/8″ | 3/4″ | 1″ | 1-1/4″ |1-1/2″ | 1-3/4″ | 2″ | 2-1/4″ | 2-1/2″ | 2-3/4″ | 3″ _ 3-1/2″ | 4″

Standard Gauges

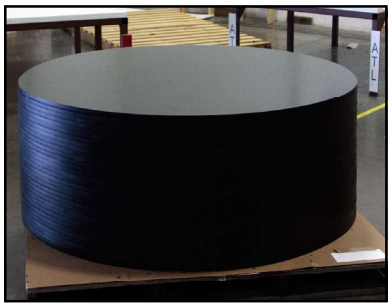
1/8″ to 1-1/2″
1/2″ to 4″

Custom Gauges Please Inquire

Physical Properties

Tensile Strength @ (PSI)		
ASTM	D638	3630
Flexural Modulus (PSI)		
ASTM	D790	150,000
Density g/cc		
ASTM	D1505	.961
Durometer Shore D		
ASTM	D2240	66
ESCR hours		
ASTM	D1693C	>5000
Notched Tensile (PENT) hours		
ASTM	F1473	>10,000

* All values are determined on specimens prepared according to ASTM testing procedures (if applicable). Normal values should not be interpreted as specifications.



King Plastic Corporation has been developing and manufacturing quality polymer sheets, slabs and massive shapes since 1968.
The King heritage is always making a tireless commitment to innovation, quality and service. Our comprehensive line of products are manufactured at our state-of -the-art headquarters in North Port, Florida, and distributed worldwide.

King Plastic's Limited Warranty is your money back or replacement of defective material. No other warranties are expressed or implied including merchantability and fitness for a particular purpose.

Distributed By:

King Plastic Corporation
1100 N. Toledo Blade Blvd., North Port, FL 34288 USA
TEL: (941) 493-5502 FAX: (941) 497-3274
www.kingplastic.com

H.D. FOWLER COMPANY

DUAL CONTAINMENT PIPING

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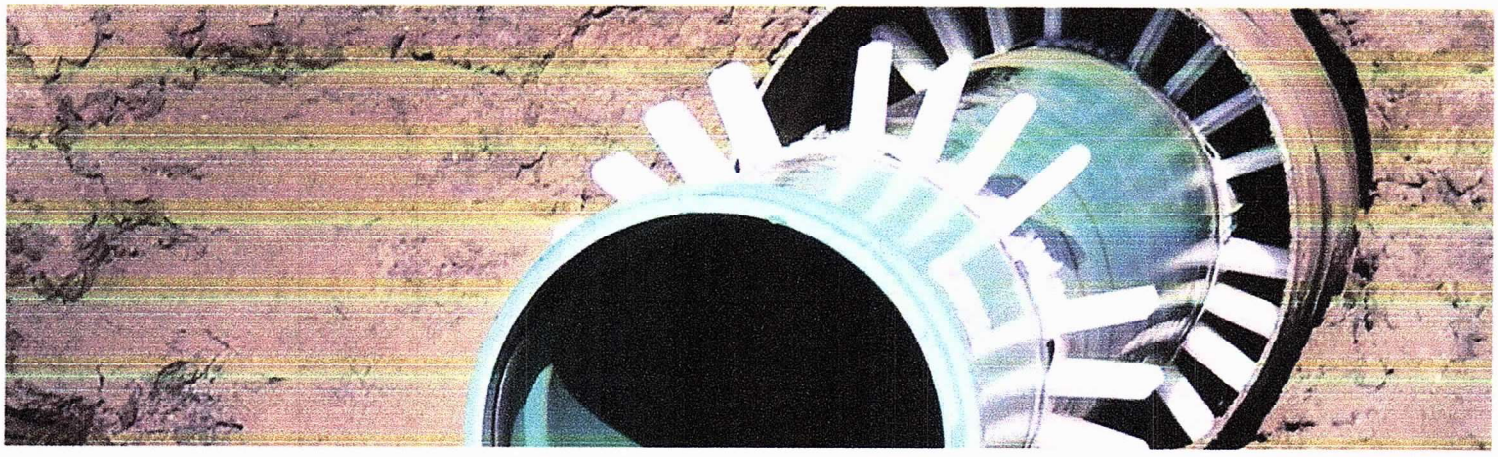
This page was blank in the original report.

Choosing a Spacer

Casing spacers are used to install carrier pipe inside the encasement pipe in order to provide support around the periphery of the pipe as it naturally rotates while being pushed through the casing.

The innovation and engineering behind Raci Spacers provides you with the best long-term protection.

Physical characteristics Raci High Density Polyethylene Spacers			
Yield Strength	3625 PSI	25 N/mm2	ASTM D 638
Tensile Strength	2900 PSI	20 N/mm2	ASTM D 638
Elongation at break	200%	200%	ASTM D 638
Hardness shore D	65	65	ASTM D 2240
Min working temperature	-4° F	-20° C	-
Dielectric strength	>940 Kv/inch	>37 Kv/mm	ASTM 149/64
UVL stabilization	yes	yes	-



APPENDIX –'A'

DESIGN CRITERIA – DUAL CONTAINED PIPING SYSTEMS

SIMULTANEOUS FUSED – DOUBLE CONTAINMENT HDPE PIPING SYSTEMS CRITICAL SDR / WALL THICKNESS DESIGN CRITERIA AND ANNULAR SPACE

Carrier Pipe (inner pipe) and Containment Pipe (outer pipe) should have wall thicknesses that are ***within 20%*** of each other to be able to be fused simultaneously with the highest acceptable level of confidence that the proper fusion can be made. (Prime acceptance range) (See examples below)

EXAMPLES OF WALL THICKNESS DIFFERENCE

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	10.75	6.625	WALL DIFFERENCE	0.104
SDR	17	9	% THE SAME	86%
WALL	0.632	0.736	Annular Difference per Side	1.430
AVG ID OF PIPE	9.43	5.09		

In the example left, the 10" IPS DR 17 and the 6" IPS DR 9 are within 14% of each other in wall thickness. This application **would be acceptable** for a simultaneous fusion system.

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	10.75	6.625	WALL DIFFERENCE	0.323
SDR	26	9	% THE SAME	56%
WALL	0.413	0.736	Annular Difference per Side	1.649
AVG ID OF PIPE	9.89	5.09		

In the example left, the 10" IPS DR 26 and the 6" IPS DR 9 are 44% different of each other in wall thickness. This application **is outside the prime acceptance range** for a simultaneous fusion system

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	12.75	8.625	WALL DIFFERENCE	0.034
SDR	17	11	% THE SAME	96%
WALL	0.750	0.784	Annular Difference per Side	1.313
AVG ID OF PIPE	11.19	6.99		

In the example left, the 12" IPS DR 17 and the 8" IPS DR 11 are within 4% of each other in wall thickness. This application **would be very good** for a simultaneous fusion system.

CONTAINMENT PIPE		CARRIER PIPE (Inner Pipe)		
PIPE SIZE (OD)	3.5	1.315	WALL DIFFERENCE	0.086
SDR	17	11	% THE SAME	172%
WALL	0.206	0.120	Annular Difference per Side	0.887
AVG ID OF PIPE	3.07	1.07		

In the example left, the 3" IPS DR 17 and the 1" IPS DR 11 are 72% different of each other in wall thickness. This application **is outside the prime acceptance range** for a simultaneous fusion system.

PAGE 2, DCS Design Criteria

An easy formula for determining if the pipe you want to use is within the pirce acceptance range:

Average Wall Thickness = (OD ÷ SDR) X 1.04

Take one wall thickness and divide it by the other, if the range is within 20% of each other (+20% or -20% from 100%) then these are acceptable pipes and SDR's. i.e.:

12.75 ÷ 17= .75 (12" IPS SDR 17)
.75 X 1.04 = .78 (average wall)

8.625 ÷ 11=.784 (8" IPS SDR 11)
.784 X 1.04=.815 (average wall)

.784 ÷ .815 = .957

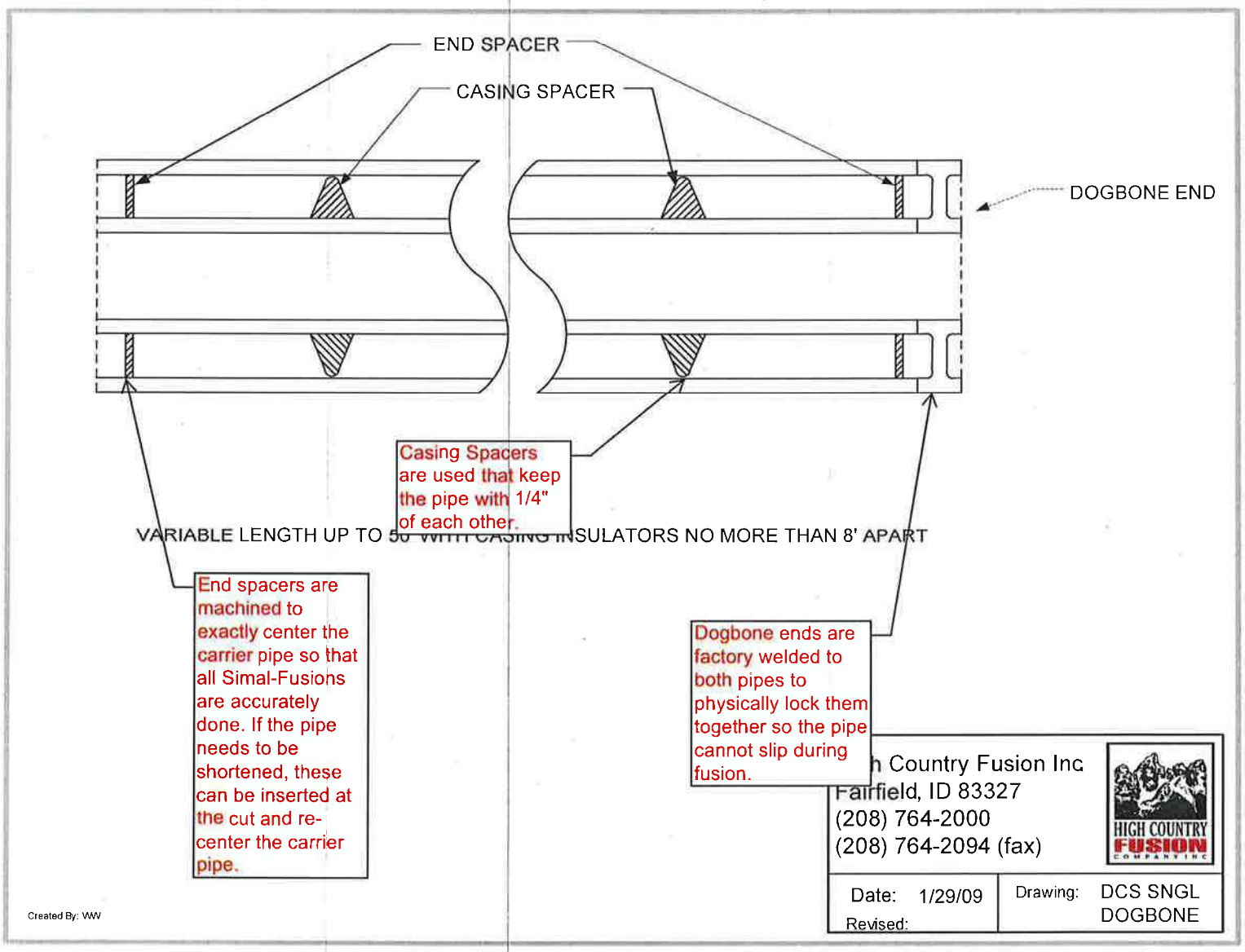
1 - .957 = .043 or 4.3%

It is possible to manufacture Simal-Fuse Dual containment piping systems that fall outside of the 20% range recommended. These systems simply increase the chances of fusion problems during installation.

Annular Space:

It is important that there is enough annular space between the OD of the inner pipe and the ID of the outer pipe to be able to fuse both pipes without the melt beads running into each other and creating sealed sections of pipe. Here is a chart with size to size recommendations. Note wall thickness difference must still be calculated to confirm pipe can be simultaneously fused.

Containment Pipe	X	Carrier Pipe	IPS Size
3.500	X	1.315	3 x 1
3.500	X	1.660	3 x 1 1/4
3.500	X	1.900	3 x 1 1/2
4.500	X	2.375	4 x 2
6.625	X	3.500	6 x 3
6.625	X	4.500	6 x 4
8.625	X	4.500	8 x 4
10.750	X	6.625	10 x 6
12.750	X	8.625	12 x 8
14.000	X	10.750	14 x 10
16.000	X	10.750	16 x 10
18.000	X	12.750	18 x 12
18.000	X	14.000	18 x 14
20.000	X	16.000	20 x 16


END SPACER
CASING SPACER
DOGBONE END
Casing Spacers are used that keep the pipe with 1/4" of each other.
VARIABLE LENGTH UP TO 50' WITH CASING INSULATORS NO MORE THAN 8' APART
End spacers are machined to exactly center the carrier pipe so that all Simal-Fusions are accurately done. If the pipe needs to be shortened, these can be inserted at the cut and re-center the carrier pipe.
Dogbone ends are factory welded to both pipes to physically lock them together so the pipe cannot slip during fusion.
h Country Fusion Inc
Fairfield, ID 83327
(208) 764-2000
(208) 764-2094 (fax)
HIGH COUNTRY FUSION COMPANY INC
Date: 1/29/09
Revised:
Drawing: DCS SNGL DOGBONE
Created By: WW

Centennial PLASTICS, INC.

CENFUSE 4710
HDPE MATERIAL DATA SHEET

CENFUSE 4710 HDPE MEETS OR EXCEEDS:
ASTM D 3035
ASTM D 3350, CELL CLASSIFICATION PE 445576C

CENFUSE 4710 PIPE FOR:
GEOTHERMAL, GROUND SOURCE HEAT PUMP APPLICATIONS.

NOMINAL PIPE PROPERTIES	ASTM METHOD	ENGLISH UNITS	SI UNITS
DENSITY (BLACK)	D 4883	-	.959 g/cc
MELT INDEX [1]	D 1238	-	8.5 g/10 min
HYDROSTATIC DESIGN BASIS @ (23° C)	D 2837	1600 psi	11.0 MPa
HYDROSTATIC DESIGN BASIS @ (60° C)	D 2837	1000 psi	6.9 MPa
CARBON BLACK CONCENTRATION	D 1603	2.30%	2.30%
NOMINAL RAW MATERIAL PROPERTIES			
TENSILE STRENGTH			
@ YIELD (2 in/min)	D 638	3625 psi	25.0 MPa
@ BREAK (2 in/min)	D 638	5500 psi	38.0 MPa
ELONGATION			
@ BREAK (2 in/min)	D 638	>600%	>600%
FLEXURAL MODULUS [2]	D 790	150,000 psi	1,035 MPa
NOTCHED IZOD IMPACT STRENGTH	D 256	9.0 ft-lbf/in	0.49 kJ/m
HARDNESS (SHORE D)	D 2240	66	66
VICAT SOFTENING POINT	D 1525	259° F	126° C
BRITTLENESS TEMPERATURE	D 746	<-180° F	<-118° C
ENVIRONMENTAL STRESS CRACK RESISTANCE [3]	D 1693	>5000 hrs.	>5000 hrs.
NOTCH TENSILE (PENT)	F 1473	>10,000 hrs.	>10,000 hrs.
CELL CLASSIFICATION	D 3350	445576C	445576C

[1] 190°C21600 g
[2] 2% Secant-Method 1
[3] Condition C

Available in Size 3/4" - 6"
SDR 9 - 17.

Centennial Plastics is an ISO 9001 certified company.
CenFuse is certified by NSF.
CenFuse meets AWWA C901 and C906 Requirements.
CenFuse HDPE 4710 is certified by NSF Standards 14 and 61.

CENTENNIAL PLASTICS INC. I 1830 CENTENNIAL AVENUE I HASTINGS, NE 68901
PHONE: (866) 851-2227 I FAX: (402) 462-5529
WWW.CENTENNIALPLASTICS.COM

W-751021-A
August 15, 2014

H.D. FOWLER COMPANY

FITTINGS

Pasco Branch
1320 N Oregon Ave.
Pasco, WA 99301
(509) 545-0255
(877) 301-0000
(509) 545-0299 Fax

HIGH COUNTRY FUSION
A Division of CONSOLIDATED PIPE & SUPPLY COMPANY, INC
20 North Poly Fusion Place
PO Box 509
Fairfield, Idaho 83327 USA
+1-208-764-2000 ISO9001:2015 certified
+1-208-764-2094 fax www.hcfusion.com or www.consolidatedpipe.com

Specifications and Material Standards for Fabricated HDPE Fittings Made of PE 4710 Material by High Country Fusion

Materials:

1. The pipe shall be made from polyethylene resin compound with a minimum cell classification of PE 445474C for PE 4710 materials in accordance with ASTM D 3350. This material shall have a Long Term Hydrostatic Strength of 2000 PSI when tested in accordance to ASTM D2837, and shall be a PPI (Plastic Pipe Institute) listed material. Pipe dimensions with be in accordance with ASTM F714 as a minimum.
2. AWWA C906- NSF Pipe used for AWWA C-906 Fittings.

Reference and testing Specifications:

1. ASTM F714: Standard Specification for Polyethylene Plastic Pipe (SDR-PR). Based on outside diameter.
2. ASTM F2206: Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene Plastic Pipe, Fittings, Sheet Stock, Plate Stock or Block Stock.
3. ASTM D3350: Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
4. ASTM D3035: Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR.) Based on Controlled Outside Diameter.
5. ASTM D3261: Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
6. ASTM F2880: Standard Specification for Lap-Joint Flange Adapters for Polyethylene Pressure Pipe in Nominal Pipe Sizes ¾" to 65 in.
7. ASTM F3123: Standard Specification for Metric Outside Diameter Polyethylene (PE) Plastic Pipe (DR-PN)
8. ASTM F3190: Standard Practice for Heat Fusion Equipment (HFE) Operator Qualification on Polyethylene (PE) and Polyamide (PA) Pipe and Fittings.
9. ASTM F3124: Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints in Plastic Piping Systems or Fittings.
10. ASME B31.3 – A328.2.5- Bonder Qualification
11. ASTM F2620: Standard practice for heat fusion joining of polyethylene pipe and fittings
12. PPI (Plastic Pipe Institute) TR-33 Butt Fusion Joining Procedures.
13. PPI (Plastic Pipe Institute) TR-41 Saddle Fusion Joining Procedures.

Organizational References:

-Member of PPI (Plastic Pipe Institute) Technical Advisory Board for M & I Division. Member PPI since 2000.
-ASTM Membership- Plastic Pipe F17 Committee member.
-Distributor Member of the Alliance for PE Pipe – Responsible Infrastructure

ISO 9001 Certification:

Products are manufactured by High Country Fusion Company in Fairfield Idaho USA, which is certified to ISO 9001 (Quality Management System) by PJR.

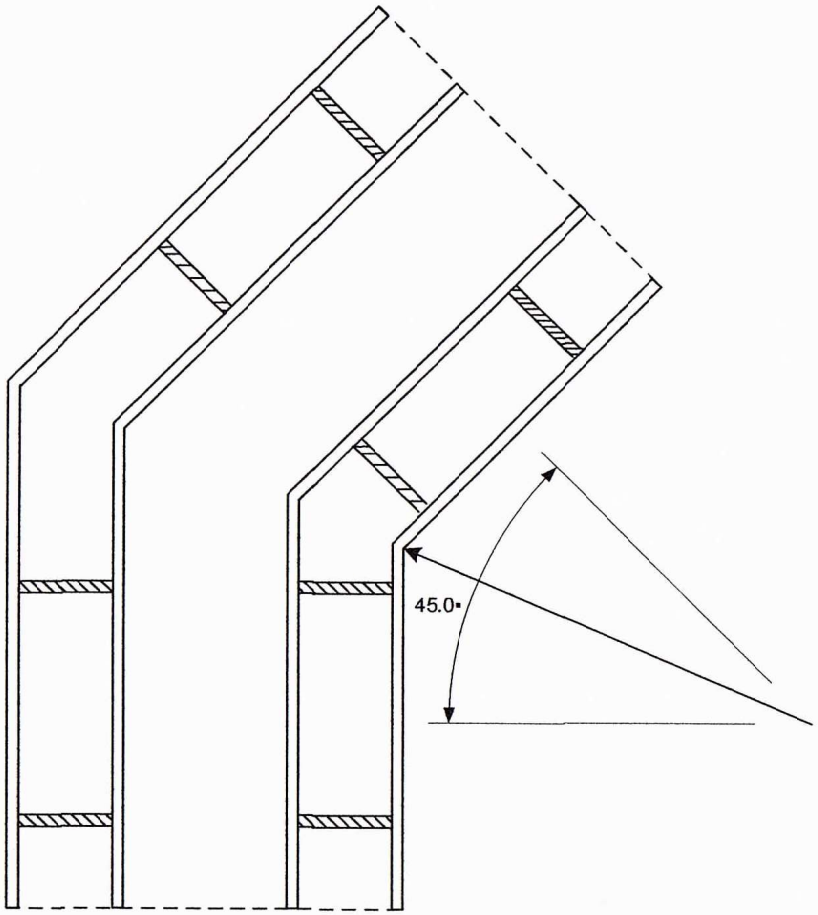
Note – HCFC may choose to refer to the above standards to provide the best possible HDPE products. If your requirements specify the conformance of any specifications listed or not listed, these must be requested before receiving a quotation and may be subject to an additional cost.

Drawing Approved By:

_____

_____

Date: _____



6" DR 17 x 3" DR 11 Dual Containment
2 piece 45 degree elbow

High Country Fusion Inc
Fairfield, ID 83327
(208) 764-2000
(208) 764-2094 (fax)

HIGH COUNTRY FUSION COMPANY INC

Date: 3/5/09 Revised: 3/11/09	Drawing: DCS 45 2P

Created By: WW

IR-332610-003

Drawing Approved By:

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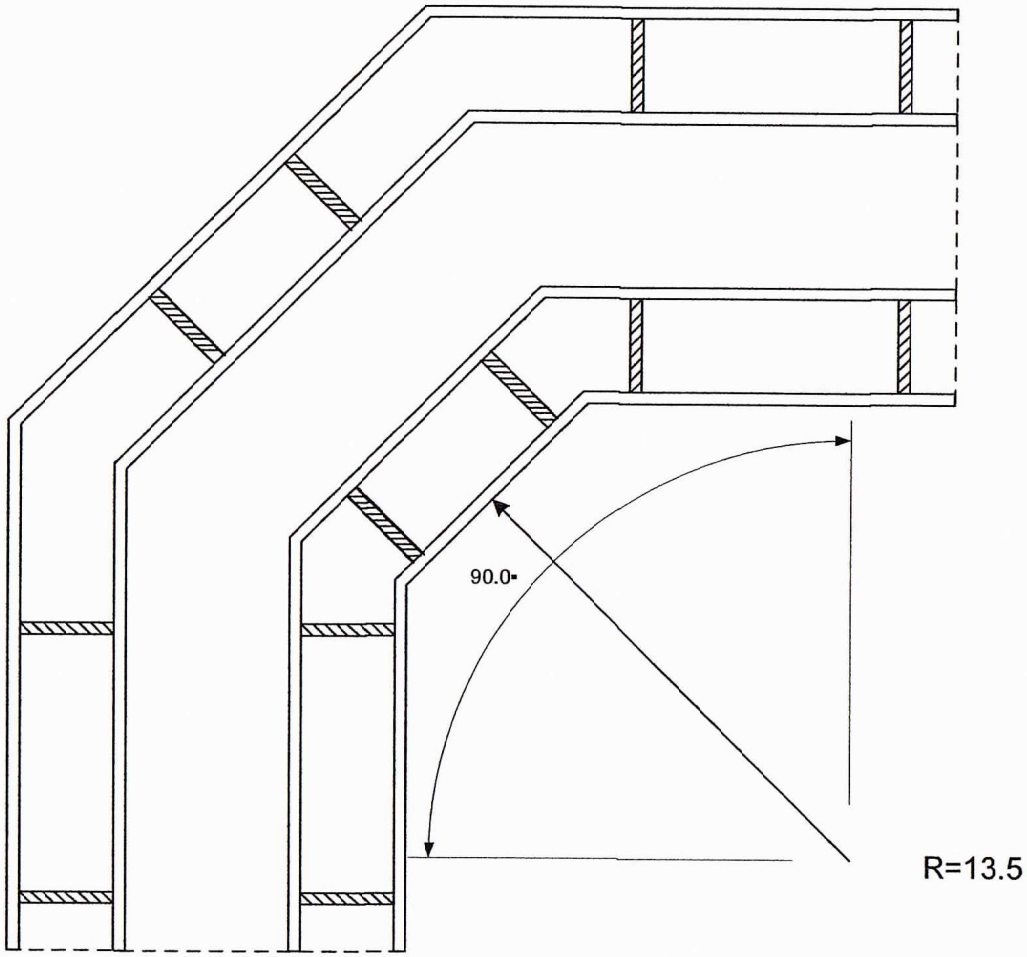
Date: _____



6" DR 17 x 3" DR 11 Dual Containment
3 piece 90 degree elbow

High Country Fusion Inc
Fairfield, ID 83327
(208) 764-2000
(208) 764-2094 (fax)

HIGH COUNTRY FUSION COMPANY INC

Date: 3/5/09 Revised: 3/11/09	Drawing: DCS 90 3P

Created By: WW

IR-332610-003

This page contains sensitive vendor information. Contact NUPI Americas for drawing no. EL10013.

Drawing Approved By:

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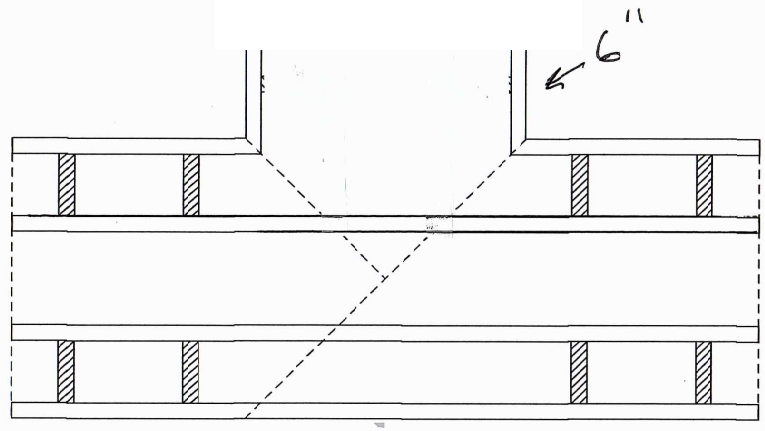
Date: _____



6"/3"
Run thru

High Country Fusion Inc
Fairfield, ID 83327
(208) 764-2000
(208) 764-2094 (fax)

HIGH COUNTRY FUSION COMPANY INC

Date: 1/28/09
Revised: 3/11/09

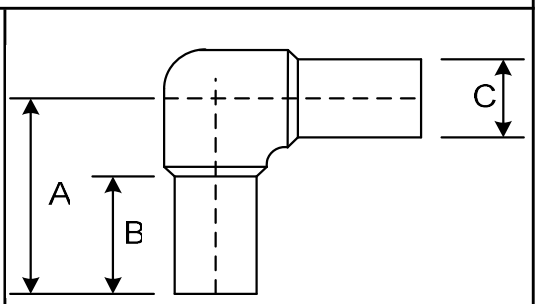
Drawing: DCS TEE

Created By: WW

MOLDED IPS 90 DEGREE ELBOWS

1/4 BEND

HIGH COUNTRY FUSION COMPANY INC



MOLDED IPS 90 DEGREE ELBOWS

IPS SIZE	A	B	C	SDR	WPR PE3608	WPR PE4710*
6"	9.00	4.38	6.625	7,9,11,17	254,200,160,100	336, 254, 200, 128

Technical Notes

* Elbows made with PE4710 Material carry these ratings when used in conjunction with PE4710 pipe.

Fully pressure rated for the SDR ordered
Dimensions are in inches
Contact your HCFC representative for a quote
All fittings meet AWWA C906 fitting requirements

This page contains contract-specific information that was removed.

CHPRC CONTRACTOR DOCUMENT SUBMITTAL FORM

(1) PROJECT NO.	(2) CONTRACT NO./RELEASE NO.	(3) SUBMITTAL REGISTER NO.	(4) VERSION	(5) DATE PREPARED
IDF Infrastructure Upgrades	71806-000	178, 179	01	5/27/2020

(6) CONTRACTOR: Intermech, Inc.

SIGNATURE Grace Johnson DATE: 5/27/2020

(7) TO: PROJECT RECORDS SPECIALIST MSIN: Phone: 509- -

RECEIVED BY E-mail: FAX: 509- -

PROJECT RECORDS SPECIALIST: _____ DATE: _____

(8) QTY/ E	(9) DOCUMENT NUMBER	(10) REV	(11) No. of pgs	(12) FORMAT (DWG, MFC, P3, GEN, PDF)	(13) TITLE / DESCRIPTION	(14) APPROVAL TYPE (AP, APW)	(15) ASSOCIATED SPEC OR SOW REF. NO.	(16) CHPRC REVIEW STATUS A	B	B	C
N/A	71806-000-SUB-178-001	01	23	PDF	Product Data - PE Manholes	APW	33 05 75				
N/A	71806-000-SUB-179-001	01	7	PDF	Field Verified Fabrication Drawings - Manholes	APW	33 05 75				

(17) SUBCONTRACTOR REMARKS (If this is a re-submittal to a previously approved submittal then explain why it is being re-submitted here.)

(18) REVIEWER DISTRIBUTION (HARD OR ELECTRONIC)

NAME	NAME	NAME

(19) CHPRC DOCUMENT APPROVER(S)	(20) DUE DATE BACK TO APPROVER(S)	(21) DUE DATE TO CONTRACTOR

(22) SUMMARY OF COMMENTS (IF ANY)

(23) BTR CONCURRENCE/APPROVAL: (NAME / SIGNATURE / DATE)

/ /

(24) PROJECT RECORDS SPECIALIST: [ ] Submittal Version Complete
[ ] Partial Complete

PROJECT RECORDS SPECIALIST _____ DATE: _____

(25) SUBMITTAL FORMAT: (USED IN BLOCK 12)

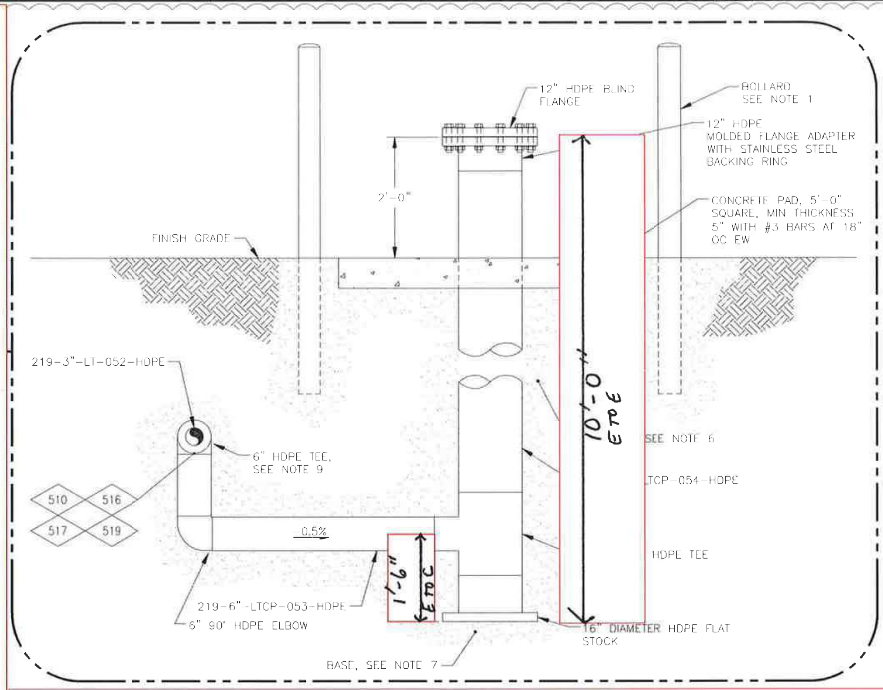
- DWG = AutoCad
- GEN = Contractor's Format
- MFC = Microsoft Format Compatible
- P3 = Primavera Schedule
- PDF = Adobe Acrobat (Portable Document Format)
- HC = Hard Copy

(26) SUBMITTAL APPROVAL TYPE: (USED IN BLOCK 14)

- APW = Approval Required Prior to Work
- AP = Approval Required

(27) SUBMITTAL REVIEW STATUS: (USED IN BLOCK 16)

- A Conforms to the Contract Requirements
- B NO-No resubmit. Minor Comments. Approved with exceptions as corrected.
- B YES-Resubmit. Minor Comments. Approved to proceed; however resubmittal is required.
- C Revise and Resubmit



MADE BY HIGH COUNTRY FUSION

MADE FROM SDR17 PIPE AND FITTINGS WITH 12" X 6" TEE, FLAT STOCK, 12" FLANGE ADAPTER, 316SS BACKING RING, AND HDPE BLIND FLANGE

PRC-03953, SECTION 33.05.33.23 INSTRUCTION SPECIFICATION.

U.S. DEPARTMENT OF ENERGY
Office of River Protection
IDF
LCRS / LDS
SECTIONS AND DETAILS

H-2-830850 0

ADD ECR-18-001801 PAGE 12 SKETCH-004

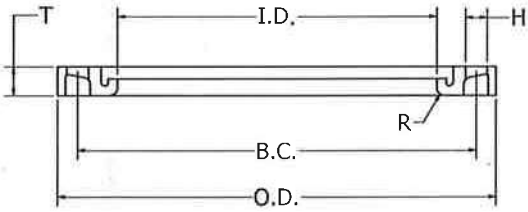
LINE 159

REVISION HISTORY			
REV	DESCRIPTION	DATE	DESIGNER
1	VALID - ORIGINAL DWG	5/5/14	JEREMY GARZA

Material: Stainless Steel ASTM A351CF8M (316), CF8 (304)

Page 1 of 2

Dimensions											
Pipe Diameter (in)	SDR	O.D.	T	I.D.	Bolt Count	Bolt Hole Size (H)	Bolt Hole Circle (BC)	R	Weight (lbs)	Pressure Class (PC)	FM APPROVED
12"	11	19.000	1.250	12.920	12	1.000	17.000	0.420	24.0	200	FM(160psi)



Notes

Improved Piping Products' backing rings and blinds mate with AWWA C207, ANSI B16.5 and ANSI B16.47, as appropriate. Specifications not stated in these standards follow internal specifications.

DRAWN Matt Graff	8/1/2011
ENG Ellis Clark	5/22/2013
QA Teresa matias	5/22/2013
VPOP	

IMPROVED PIPING PRODUCTS, INC.

TITLE: SS-SDR Stainless Steel Flange / Backup Ring Submittal Sheet

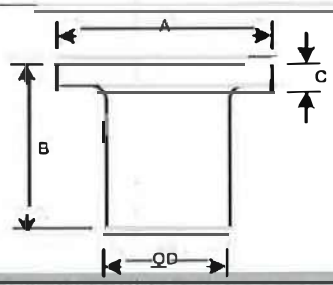
UNLESS OTHERWISE NOTED, ALL DIMENSIONS IN INCHES

SIZE C | PART NO SS-SDR Submittal | SALES NO | SCALE | REV 1 | SHEET 1 OF 2

Ongoing engineering design efforts may affect the technical information listed in our publications.

MOLDED / MACHINED IPS FLANGE ADAPTERS

HIGH COUNTRY FUSION COMPANY INC



MOLDED / MACHINED IPS FLANGE ADAPTERS

IPS SIZE	TRUE OD	A	B	C	SDR	WPR PE3608	WPR PE4710[7]
12"	12.750	15.00	12.00	1.54[4]	7,9,11,17	254,200,160,100	330,250,200,120

Technical Notes

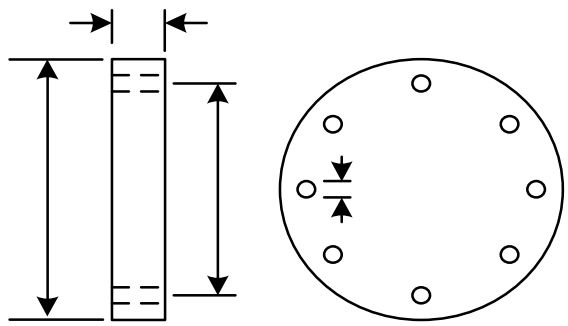
Dimensions are in inches
Back up rings sold separately, for dimensions see pg. D-8
For example of how Flange Adapters work with Back up rings see page D-3
[4]=Face thickness is for SDR 11, call for specifics on other SDR's
[6]=Face thickness is for SDR 11, 1.25 x wall thickness
[9]=Face thickness is for SDR 17, 1.25 x wall thickness.
[7]=Pressure ratings apply when using in conjunction with PE4710 pipe.
Other sizes, styles and SDR's not listed are available. Contact your HCFC representative for a quote
Sizes 24" and smaller meet AWWA C906 fitting requirements

PHONE: 800-780-6330
FAX: 208-764-2094
www.hcfusion.com

HDPE BLIND FLANGES

FOR BOTH IPS AND DIPS PIPE SIZES

HIGH COUNTRY FUSION COMPANY INC



HDPE BLIND FLANGES

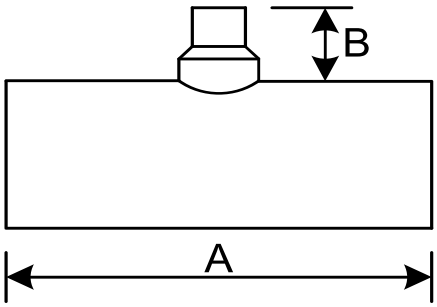
SIZE	OUTSIDE DIAMETER "OD"	BOLT CIRCLE "BC"	THICKNESS "T"	# OF BOLTS "N"	BOLT HOLE DIAMETER "D"
12"	19.00	17.00	1" / 2"	12	1.00

Technical Notes

These blind flanges are ordinarily used for closure or nitecapping of flanged pipes.
They are NOT fully pressure rated
Without the use of a metal back-up blind flange, the HDPE flange may leak between bolt holes at moderate pressures
Dimensions are in Inches

IPS FABRICATED REDUCING TEES

HIGH COUNTRY FUSION COMPANY INC



IPS FABRICATED REDUCING TEES

IPS SIZE	A	B	SDR
12" X 6"	28.00	6.00	9-17

Technical Notes

For Derating factors please refer to derating chart in HDPE Pipe Section. Outlet size and SDR determines if derating occurs

Fittings available in PE 3408 and PE4710.

Fully pressure rated reducing tees are available with outlet sizes 3/4" to 24" IPS.

Other sizes and SDR's not listed are available.

Contact your HCFC representative for a quote

Sizes 24" and smaller meet AWWA C906 fitting requirements.

Dimensions are in Inches

PHONE: 800-780-6330
FAX: 208-764-2094
www.hcfusion.com

16" X 1" FLANGE AT BOTTOM CUT FROM FLAT STOCK HDPE PER THESE SPECIFICATIONS

KING PIPEGRADE®

This massive custom T-section produced by Independent Pipe Products utililizes King PipeGrade® PE 100 material in multiple components of the pipe.

- Made of the finest polymers available, using any of our proprietary K-Stran® process, compression molding or our extrusion molding process.
- Environmentally stabilized for tough and demanding conditions.
- Blocks and slabs available to custom thickness up to 30″ and 96″ width.
- 50-100 years service life per ISO CRS 10 MPa @ 20°C.
- Superior Slow Crack Growth (SCG) resistance.
- High temperature/pressure performance.
- Enhanced fusion to MSPE and other HDPE pipe grades.
- Increased tensile strength and modulus.

The Superior Polymer For The Pipe Industry

King PipeGrade® is a special black polyethylene material is formulated for the pipe industry. It is available in sheets, slabs, and massive shapes.

King PipeGrade® is now offering PE 4710/PE 100 material as our standard, which is compliant to ASTM D3350 as a standard material.

ASTM D3350 covers 4710 PE100 which is completely compatible and 100% interchangeable for use in applications that presently use ASTM 3608 - PE 80 material. PE4710-PE100 tends to have a higher hydrostatic design basis (HDB) than other resins but most significantly is the notched tensile/slow crack PENT test which is >10,000 hours vs.100-200 hours for the others.

IR-332610-003

Standard Color

Black

Standard Sheet Sizes

1/8″ | 3/16″ | 1/4″ | 3/8″ | 1/2″ | 5/8″ | 3/4″ | 1″ | 1-1/4″ |1-1/2″ | 1-3/4″ | 2″ | 2-1/4″ | 2-1/2″ | 2-3/4″ | 3″ _ 3-1/2″ | 4″

Standard Gauges

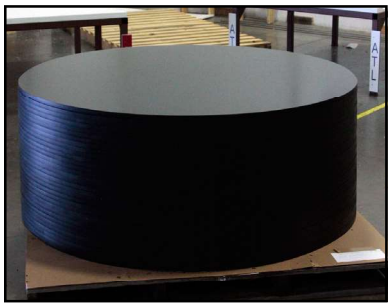
1/8″ to 1-1/2″
1/2″ to 4″

Custom Gauges Please Inquire

Physical Properties

Tensile Strength @ (PSI)		
ASTM	D638	3630
Flexural Modulus (PSI)		
ASTM	D790	150,000
Density g/cc		
ASTM	D1505	.961
Durometer Shore D		
ASTM	D2240	66
ESCR hours		
ASTM	D1693C	>5000
Notched Tensile (PENT) hours		
ASTM	F1473	>10,000

* All values are determined on specimens prepared according to ASTM testing procedures (if applicable). Normal values should not be interpreted as specifications.



King Plastic Corporation has been developing and manufacturing quality polymer sheets, slabs and massive shapes since 1968.
The King heritage is always making a tireless commitment to innovation, quality and service. Our comprehensive line of products are manufactured at our state-of -the-art headquarters in North Port, Florida, and distributed worldwide.

King Plastic's Limited Warranty is your money back or replacement of defective material. No other warranties are expressed or implied including merchantability and fitness for a particular purpose.

Distributed By:

King Plastic Corporation
1100 N. Toledo Blade Blvd., North Port, FL 34288 USA
TEL: (941) 493-5502 FAX: (941) 497-3274
www.kingplastic.com

Inspection No.: IR-332610-006	Meier Project No. 8692	Project Title: IDF Upgrades

Inspection Description: Witness the fuse welding of the sumps to the transfer line.

Contract No.:	332610

Components or System Inspected:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement.
- Leachate transfer pipeline sumps:
  - LTS-1.
  - LTS-2.
  - LTS-3
  - LTS-4.

Inspector:	Randy Saworski	Date and Time:	11/2/2020	7:30 AM

Reference Documents	Rev No.	Reference Documents	Rev No.
ECR-18-001801, *IDF Leachate Tank 219A201 and 219E201 Connection*, Page 10 & 11.	00	Work Package: CS-19-07224-K WCN-2, IDF Trenching/Utility Instillation.	N/A
IP-332610-01, Table 3	A	Bonding Procedure Specification (BPS), HDPE-02	0
Bonder Qualification: James Connell, Stamp No. 419.	n/a		

Background and Objective: Observe the fuse welding of the assemblies listed below:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement.
- Leachate transfer pipeline sumps:
  - LTS-1.
  - LTS-2.
  - LTS-3
  - LTS-4.

Items checked below were inspected to ensure compliance with the requirements of 40 CFR 265 Subpart J "Tank Systems" and WAC 173-303-640 "Tanks Systems" to treat and store dangerous waste. WA Ecology Guide 94-114, "Guidance for Assessing and Certifying Tank Systems" is used for reference only.

Inspection Criteria ☐ Existing Tank System ☒ New Tank System	CFR 265.191 Existing	CFR 265.192 New	WAC Existing Tank Systems	WAC New Tank Systems	Ecology Guide 94-114
☐ Document Review					
☒ Other: Observe the fuse welding of the transfer line and sumps assemblies listed below.					
☐ Weld breaks		(b)(1)		(3)(c)(i)	4.1
☐ Punctures		(b)(2)		(3)(c)(ii)	4.1
☐ Scrapes of protective coatings		(b)(3)		(3)(c)(iii)	4.1
☐ Cracks		(b)(4)		(3)(c)(iv)	4.1
☐ Corrosion	(b)(3)	(b)(5)		(3)(c)(v)	4.1
☐ Other structural damage or inadequate construction / installation	(a),(b)	(b)(6)		(3)(c)(vi)	4.1
☐ Placement of reinforcing steel and anchor bolts					4.1
☐ Concrete placement					4.1
☐ Subgrade and foundation preparation					4.1
☐ Placement of shop-fabricated tanks					4.1
☐ Erection of field-erected tanks					4.1
☐ Installation of secondary containment liner or vault					4.1
☐ Installation of piping, pumping, and other ancillary equipment					4.1
☐ Placement and compaction of backfill				(3)(d)	4.1
☒ Visual inspection/leak tightness/ pressure testing	(b)(5)		(2)(c)(v)	(3)(e)	4.1/4.2
☐ Ancillary equipment supports and protection	(b)(1)			(3)(f)	3.5
☐ Corrosion protection systems	(b)(3)		(2)(c)(iii)	(3)(g)	4.3

Contacts Made During Inspection

Name	Title	Company
Tracey Kasselder	Field Work Supervisor	Fowler General Construction Inc.

Summary, Results, and Conclusions:

Inspection Requirements:

- Observe the installation of the leachate transfer lines and sump assemblies.
- Review the fuse welding procedures.

Inspection Results:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3”-LT-052-HDPE w/6 encasement:
- Leachate transfer pipeline sumps:
  - LTS-1.

- LTS-2.
- LTS-3
- LTS-4.
  - Reviewed the work steps in Work Order CS-19-07224-K WCN-2.
  - Reviewed the Bonding Procedure Specification HDPE-02 Rev 0.
  - Reviewed the Bonder Qualifications for James Connell.
  - Pressure was regulated at 150 ft lbs. utilizing a calibrated torque wrench (id TMC-150-04 Cal due 9/29/2021).
  - Bond temperature was monitored with a calibrated laser Thermometer (id TMC-TI-26 Cal due 6/17/2021).
  - Observed the bonding of the following HDPE 6" pipe:
    - LTS-1. Bond 54 pipe 6 HB.
    - LTS-2. Bond 55 pipe 7 HB.
    - LTS-3. Bond 56 pipe 8 HB.
    - LTS-4. Bond 57 pipe 9 HB.
  - All bonding was observed to be completed per bonding procedure HDPE-02 rev 0.

- No Non-Conformance Reports (NCRs) were generated during the fuse welding of the listed pipe and sump assemblies.

Based on the witness of the welding and review of the documentation, no discrepancies were found. See attached selection of the reference documents and photographs.

All documents reviewed were acceptable.

QII Signature	11-12-20 Date	IQRPE Signature	11/13/2020 Date
QII Print Name: Randy Saworski		IQRPE Print Name: Paul Giever	

INFORMATION ONLY

0 **5.5.2** TRENCHING

0 • SLOPING and or shoring

0 • POTHOLING if required

0 **5.5.3** BEDDING

0 • INSTALL HDPE piping between Leachate Tanks.

0 • REROUTE existing 1' Raw Water line

NOTES:

1. *ASME B31.3 category D fluid service requires final certification from the QC examiner that sufficient visual inspections have been performed to satisfy the examiner that components, materials, and workmanship conform to the Code and engineering design.*
2. *This certification will be on the QC INSPECTION RECORD DATA SHEET (S) Attachment 5.*
3. *Step 5.5.3.1 May be repeated for all HDPE welds.*

0 **5.5.3.1** BOND DWHDPE pipe to Dog Bone or flanged termination fitting in accordance with BPS-010, "*Thermal Fusion Butt Joints on Thermoplastic Plastic Double-Wall Pressure Pipe and Fittings*". Attachment 5.

0 **5.5.3.2** PERFORM Sump Leakage test if required.

5.5.3.3 PERFORM Testing of system per INTERMEC Test plan.

- PERFORM Backfilling
- SPREAD and Compact Gravel.
  - Perform Compaction testing if required.

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Sign: Paul Branson Date: 10/12/20

Intermech
An EMCOR Company

Bonding Procedure Specification (BPS)

BPS No.: HDPE-02 Rev 0 **Date:** 9/16/2020 **Supporting BQR No.(s):** HDPE-02A Rev 0
Welding Process(es): Thermal Butt Fusion **Type (s)** Manual
Qualification Code: ASME B31.3

Certifying INTERMECH, INC. Signature Grace Johnson 9-16-2020
Grace Johnson Date:

JOINTS: Square Butt

BASE MATERIALS: High Density Polyethylene (HDPE) Plastics

PRODUCT FORM: Double-Wall Pipe and Fittings

THICKNESS RANGE: No limit

DIAMETER QUALIFICATION RANGE: Double-Wall Pipe, containment pipe 16" outside diameter and smaller

POSITIONS: All Positions

Scope: The purpose of this bonding procedure specification (BPS) is to provide a procedure to simultaneously fusion bond thermoplastic plastic double-wall (dual containment) pipe (and fittings) where both pipes (carrier and containment pipe) are bonded at the same time. The principal of fusion bonding is to heat two surfaces to a designated temperature, and then fuse them together by the application of force. The double-wall pipe is received from the manufacturer with a Dogbone end bonded to the carrier and containment pipes on one end to prevent any axial movement between the two pipes. This BPS covers the bonding between the Dogbone end of one double-wall pipe spool (or fitting with a Dogbone end) and the non-dog-bone end of another double-wall pipe spool

BONDING STEPS:

1. Select and install the appropriate size clamping inserts for the size of containment pipe to be fused.
   Note: Refer to the fusion machine owner's manual for proper setup and operation of the equipment
2. Ensure that all foreign matter is removed from the piping component surfaces that will be covered by the clamps of the bonding machine.
3. If necessary, place pipe support stands at both ends of the butt fusion machine and adjust the support stands to align the containment pipe with the fusion machine centerline.
4. Loading Pipe Into Machine – Clean the inside and outside of pipe ends that are to be fused with a clean, lint free, dry, cotton cloth. Open the upper jaws and insert pipe in each pair of jaws with applicable inserts installed. Let the ends of the pipe protrude about 1" past the face of the jaws.
5. Verify centralizer is installed on the non-dog-bone end of the pipe spool that is planned to be bonded (See Figure 3). Centralizer shall be within 2-4" from end of carrier pipe. The centralizer is used on the non-dog-bone end to center the pipe so that the fusion surfaces between the Dogbone end and the non-dog-bone end are aligned and also stiffen the encasement pipe when clamped in the fusion machine. The centralizer is not bonded to either the carrier or containment pipe. To ease the installation of the centralizer, one side of the outside diameter can be slightly beveled.
6. Verify the carrier pipe is centrally located within the encasement pipe by comparing radial measurements 90° apart.
7. Starting fusion machine gas engine - Prior to starting the gas engine, turn on facer by opening valve on top of the facer. Once engine is started, facer can be shut off by closing the valve.
8. Plug in the heater to the fusion machine. Check the equipment for proper operation and sufficient power. The optimum fusion temperature for HDPE material is approximately 425°F.
9. Plug in datalogger into datalogger port.
10. Swing the facer into place. The facer is a rotary planer that "shaves" the pipe ends to provide clean, parallel pipe ends. Proper facing is critical in any butt fusion procedure. Before facing, wipe the pipe ends with a clean, isopropyl alcohol damped, cotton cloth. With the carriage control valve lever, move the carriage toward the fixed jaws, while watching the gap at each end of the facer rest buttons. When the pipe is in contact with the facer, this gap indicates the amount of material that will be trimmed from the pipe end. Assure sufficient material will be removed for a

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An EMCOR Company
Sign: Paul Branson Date: 10/12/20

Bonding Procedure Specification (BPS)

complete face off. Tighten the clamp knobs on the outside jaws. Hand tighten the inside clamp knobs. Facing establishes clean, parallel mating surfaces perpendicular to the centerlines of the pipes.

11. Begin Facing - Turn facer on by opening valve on top of the facer. Move the selector valve on the hydraulic manifold block to the top (facing pressure) position. The facing pressure should be set as low as possible while still facing pipe. Excessive facing pressure can damage the facer. It may be necessary to adjust the carriage pressure. Activate the carriage control valve and move the carriage to the left to begin facing. Continue to face the pipe until the rest buttons on the jaws bottom out on the facer rest buttons. The end of the encasement and carrier pipe shall be square and flush. The bonding surface shall be perpendicular to the pipe centerline. After pipe is faced, face the Dogbone end enough to clean and remove any indentations on the bonding surface. Remove as little material as possible. A minimum of 1/4in is required for the Dogbone face (See Fig 3).
12. After Facing - Turn facer motor off. Move carriage all the way to the right. Center the facer in between the pipe ends to avoid dragging facer stops on the pipe ends. Swing facer to the out position. Remove the pipe shavings and using another clean, dry, cotton cloth to wipe the pipe ends again. Do not touch faced pipe ends. Once facing is complete all four pipe ends will be smooth, clean and parallel.
13. Clean bonding surfaces with a clean, isopropyl alcohol damped, lint free, cotton cloth.
14. Determine Drag Pressure - Drag pressure should be determine9 using the following procedure: Move the carriage so that the faced pipe ends are approximately 2" apart. Shift the carriage control valve to the middle (neutral) position. Select the heating mode, and adjust the middle pressure reducing valve to its lowest pressure by turning the valve counterclockwise. Shift the carriage control valve to the left. Gradually increase the pressure by turning the valve clockwise. Increase the pressure until the carriage moves. Quickly reduce the heating pressure valve counterclockwise until the carriage is just barely moving. Record this actual drag pressure.
15. Set Fusion Pressure - With the selector valve in the down position, the fusion pressure can be set (see fusion machine manual). The theoretical fusion pressure can be calculated using the fusion pressure calculator enclosed with the fusion machine. Always add drag pressure to the theoretical fusion pressure Gauge (Fusion) Pressure = Theoretical Fusion Pressure + Drag Pressure.
16. Check for Slippage - Bring the two sections of pipe together under fusion pressure to make sure they don't slip in the jaws. If pipe slips, return to step 4.
17. Check Alignment - Move carriage to the left at facing pressure until pipe ends contact. Look across the top surface of pipe ends to check alignment. If there is a noticeable step across the joint, adjustments must be made. If pipe is not lined up, tighten the high side jaw to bring into alignment. **IMPORTANT:** Always tighten the side that is higher, never loosen the low side. When the pipe is properly aligned, ensure all clamp knobs are tight. **NOTICE:** When clamping, do not over-tighten the clamp knobs because machine damage can result. Check to see if there is space between the upper and lower jaws. If the two jaws are touching, do not continue to tighten. The maximum high-low misalignment allowed in a butt fusion joint is to be less than 10% of the pipe minimum wall thickness.
18. Position Carriage for Heater Insertion - Move carriage to the right to open a gap large enough to insert the heater.
19. Check Heater Temperature - Verify heater temperature by noting the reading on the dial thermometer. Verify the heater plate surface temperatures are within a temperature range of 400 to 450°F with 425°F considered optimum (Ref. Step 8). A calibrated pyrometer or other temperature measuring device should be used before the first joint of the day and periodically throughout the day to assure proper temperature of the heater plate face. The dial thermometer on the heater indicates internal temperature which can vary from actual plate surface temperature. The dial temperature can be used as a reference once the surface temperature has been verified with a pyrometer.
20. Inserting Heater - Check the fit of the heater in the fusion machine and check the heater surface condition. Wipe off the heater face with a clean, dry 100% cotton cloth (synthetics will melt) before each weld with no exceptions. The heating plate surfaces, coated or uncoated, shall be kept clean and free of contaminants such as dirt, grease or plastic build-up which may cause sticking and produce unsatisfactory joints.
21. Heat Pipe – The pipe ends are then separated so the heater can be placed in the fusion machine. The heater is placed in the fusion unit. The pipe ends are then brought in direct contact with the heater plate. Check to make sure that the containment pipe ends are in full contact with the heater on both sides. Fusion Pressure is applied at this time and fusion pressure must be maintained until a slight melt is observed around the circumference of the containment pipe before releasing pressure to generate the start of the heat soak cycle. **Maintain pipe location to assure pipe stays in contact with the heater.** A bead of material will form as the containment pipe heats up and "flares" outward from the expansion of the pipe end. The weld bead formation is observed and indicates when the pipe is hot enough. The weld bead on the outside diameter (OD) of the containment pipe should have the approximate size as shown in Fig 1. The weld bead should be uniform around the containment pipe OD. Correct weld bead formation and size indicates sufficient heat soak.

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Sign: Paul Branson Date: 10/12/20

Bonding Procedure Specification (BPS)

22. When the weld bead is formed evenly around the pipe ends, move the carriage to the right just enough to quickly remove the heater.
23. A visual check is done when the heater is removed. Quickly inspect pipe ends for appropriate melt. The weld bead will have formed on the ID as well as the observed bead on the OD of the containment pipe and on both the OD and ID of the carrier pipe. The pipe end itself should be flat or slightly convex with the bead flaring away from the pipe ends. **A concave profile on the end of the heated pipe is not acceptable.**
24. Fusing the Pipe - When heater is clear of the jaws, quickly move the carriage to the left and bring the pipe ends together using the pipe manufacturer's recommended pressure. See Figure 2 for approximate melt bead sizes. Follow the fusion machine operating instructions for applying fusion pressure. As fusion pressure is applied, the weld bead roll-back is observed on the outside of the containment pipe. When the bead has properly rolled-back, lock the machine so pressure is constant on the joint until it has cooled sufficiently. Visually, the width of the butt fusion beads should be approximately 2 to 2-1/2 times the bead height above the pipe surface. The beads should be rounded and uniform all around the pipe circumference. The Vee-groove between the beads should not be deeper than one half the bead height above the pipe surface (See Figure 2).
25. At this point the fusion weld is nearly complete. The pipe weld has only to cool down. Cooling under pressure before removal from the fusion machine is important in achieving joint integrity. Maintain fusion pressure against the piping component ends for approximately 90 seconds per inch of pipe diameter (or until the surface of the bead is cool to the touch).
26. Visually check the entire circumference of the joint for compliance with Figure 2
27. Opening Movable Jaws - After the joint has cooled, loosen all clamp knobs, and open the movable jaws. Avoid high stress such as pulling, rough handling or installation for 30 minutes or more after removal from the fusion machine. Do not apply internal pressure until the joint and surrounding material have reached ambient air temperature.

Cold Weather Handling (Below 40°F)

1. The heating tool should be shielded in an insulated container to prevent excessive heat loss. Shield the pipe fusion area and the fusion tools from wind, snow and rain by using a canopy or similar device. The pipe surfaces to be joined shall be dry and clean and free of ice, frost, snow, dirt and other contaminants. Keep the heating tool dry at all times. Regularly check the temperature of the heating tool with a pyrometer or other measuring device. Keep the heating tool in an insulated container between fusions. Do not increase the heating tool temperature above the specified temperature setting.

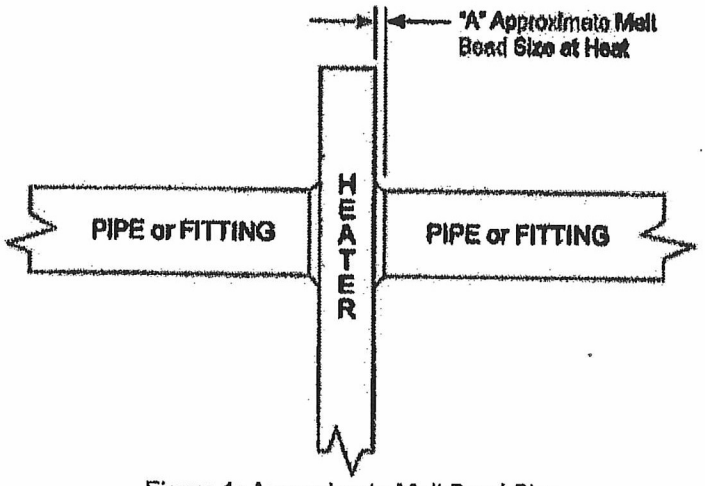

Figure 1: Approximate Melt Bead Size

Containment Pipe Size	Approximate Melt Bead Size (A)
1-1/4 in. NPS and smaller	1/32 to 1/16 in.
Greater than 1-1/4 in. NPS through 3 in. NPS	1/16 in.
Greater than 3 in. NPS through 8 in. NPS	1/8 to 3/16 in.
Greater than 8 in. NPS through 12 in. NPS	3/16 to 1/4 in.

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An EMCOR Company
Sign: Paul Branson Date: 10/12/20

Bonding Procedure Specification (BPS)

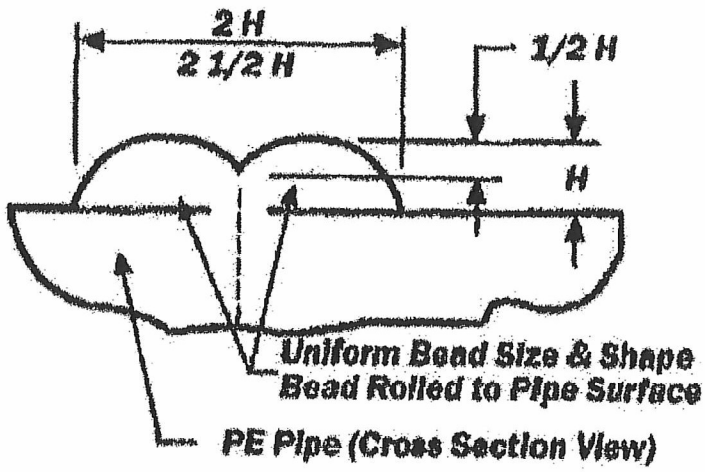
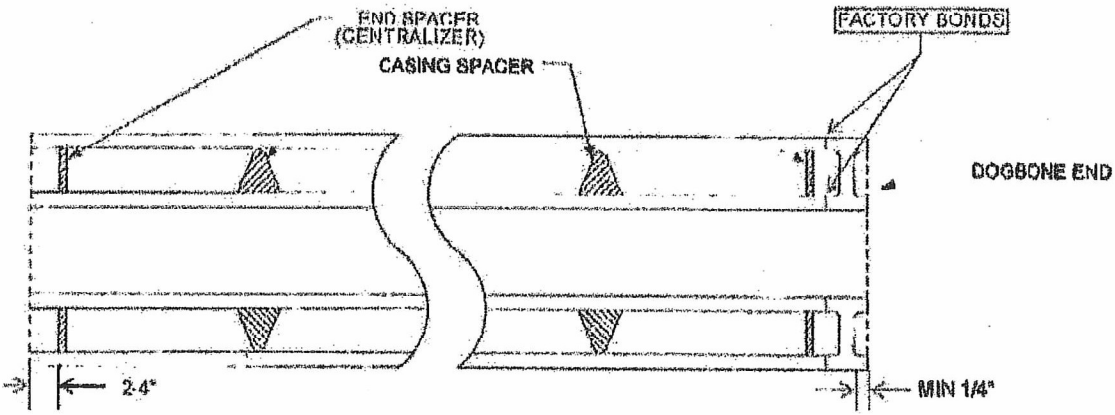


Figure 2: Butt Fusion Bead Dimensional Guidelines



VARIABLE LENGTH UP TO 50' WITH CASING INSULATORS NO MORE THAN 8' APART

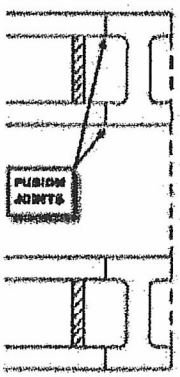
Figure 3 Double-Wall Pipe Spool

PROCUREMENT / CONTRACT SUBMITTAL
Intermech
An EMCOR Company
Sign: Paul Branson Date: 10/12/20

Bonding Procedure Qualification Record

Procedure Qualification Record No.:	HDPE-02A	**Date**	9/16/2020
BPS No.:	HDPE-02		
Bonding Process(es):	Thermal Fusion Joint		
Type (Manual, Automatic, Semi-Auto.):	Machine		

JOINT DESIGN
Double Wall Pipe, Square Butt Joints



BASE MATERIALS
Double Wall HDPE Pipe

Material Spec: ASTM F714
Type/Grade: PE 4710
Thickness of Coupon:
Carrier pipe 3in SDR 11 (0.389 in wall)
Containment pipe 6in SDR 17 (0.390 in wall)

Test Coupon Diameter: 3.5" OD and 6.5" OD

Only carrier pipe bond tested:
Coupon thickness 0.389 in.

POSITIONS: Horizontal

TEMPERATURE: N/A

CURE: 30 Min

TEST RESULTS

Imperfections	Socket Fusion Bond
Cracks	Not applicable
Unfilled areas in joint	None permitted
Unbonded areas in joint	None permitted
Inclusions of charred material	Not applicable
Unfused filler inclusions	Not applicable
Protrusion of material into pipe bore, % of wall T	Fused material, 25%
Visual inspection results:	SATISFACTORY
Hydrostatic Testing results: Pressure: 420 PSI Duration: 1 Hour (Reference ASME B31.3, A328.2.5)	SATISFACTORY
Bonders Name: Russell Matheny, Tyler Mayfield, James Connell, Kyle Staats, Zachary Patton **Test Conducted By:** Grace Johnson	**Stamp No.:** TM-421, TM-TM-378, TM-419, TM-420, TM-416 **Laboratory Test No.:** N/A

We certify that the statements in this record are correct and that the test bonds were prepared, bonded and tested in accordance with the requirements of ASME B31.3-2016.

By: Grace Johnson Date: 9-16-2020

PROCUREMENT / CONTRACT SUBMITTAL
Intermech
An EMCOR Company
Sign: Paul Branson Date: 10/14/20

BONDER PERFORMANCE QUALIFICATION (BPQR)

Bonder's name: James Connell **Stamp No.:** TM-419

BPS followed by welder during welding of test coupon: HDPE-02

Base material(s) bonded: ASTM F714, PE4710 Thickness 3in SDR 11 (0.389 in wall)

Bonding Variables	Actual Values	Range Qualified
Bonding Procedure Specification (BPS)	HDPE-02	HDPE-02
Bonding Process	Thermal Fusion	Thermal Fusion
Process operation (i.e., manual, machine)	Manual	Manual
Backing material	N/A	N/A
Joint design	Butt Joint	Butt Joint
Plate [ ] Pipe [X] (enter diameter if pipe or tube)	3in NPS	≤ 16in NPS
Filler material	N/A	N/A
Position	Horizontal	Horizontal

Test / Results

Visually inspect the complete bond per the following table:

Imperfections	Hot Gas Weld	Solvent Cemented	Heat Fusion	Adhesive Cemented
Cracks	None permitted	Not applicable	Not applicable	Not applicable
Unfilled areas in joint	None permitted	None permitted	None permitted	None permitted
Unbonded areas in joint	Not applicable	None permitted	None permitted	None permitted
Inclusions of charred mtrl	None permitted	Not applicable	Not applicable	Not applicable
Unfused filler inclusions	None permitted	Not applicable	Not applicable	Not applicable
Protrusion of mtrl into pipe bore, % of wall T	Not applicable	Cement, 50%	Fused material, 25%	Adhesive, 25%

Visual inspection results: Acceptable

Tests and exams per ASME B31.3:

Test Description	Test Results
1) Hydrostatic @420 PSI for 1 HR	Passed
2)	
3)	

Test assembly notes:

1. The assembly shall be fabricated in one piece pipe size in accordance with the BPS and shall contain at least one of each of the different type joints identified in the BPS.
2. More than one test assembly may be prepared if necessary to accommodate all of the joint types or to assure that at least one of each joint type is loaded in both circumferential and longitudinal directions.
3. Pipe size and fittings shall be as follows:
   A. When the largest size to be joined is DN 100 (NPS 4) or smaller, the test assembly shall be the largest size to be joined.
   B. When the largest size to be joined is greater than DN 100 (NPS 4), the size of the test assembly shall be between 25% and 100% of the largest piping size to be joined, but shall be a minimum of DN 100 (NPS 4).

The following test shall be conducted in accordance with ASME B31.3 paragraph A328.2.5:

Burst Test Method Test Results N/A

Hydrostatic Test Method (1 HR @ psi) Test Results Satisfactory

Bonding supervised by Russell Matheny / Scott Hanson Organization Intermech, Inc. Richland Division

We certify that the statements in this record are correct and that the test coupons were prepared, welded and tested in accordance with the requirements of ASME B31.3-2016.

Test Date: 9-16-2020 Certification: Gracejohnson

Date	Bond / Pipe Size	Welder	Bond / PVC Number	Procedure #	Weld ID / Date On Pipe
Today	3" PVC	TM-99	0	PVC-01	Yes, Labeled at Bond / Weld
10-19-20	3"x6" dual wall	TM-419	41 (24 DL)	HDPE-02	CB 10/29/20
10-20-20	" "	TM-419	42 (25 DL)	" "	CB 10/29/20
10-20-20	" "	TM-419	43 (26 DL)	" "	CB 10/29/20
10-20-20	6"	TM-419	44	HDPE-03	CB 10/29/20
10-20-20	6"	TM-419	45	" "	CB 10/29/20
10-20-20	3"x6" dual wall	TM-419	46 (27 DL)	HDPE-02	CB 10/29/20
10-20-20	" "	TM-419	47 (28 DL)	" "	CB 10/29/20
10-26-20	" "	TM-419	48 (1 HB)		CB 10/29/20
10-26-20	" "	TM-419	49 (2 HB)		CB 10/29/20
10-27-20	" "	TM-419	50 (3 HB)		CB 10/29/20
10-27-20	" "	TM-419	51 (4 HB)		CB 10/29/20
10-27-20	" "	TM-419	52 (5 HB)		CB 10/29/20
10-27-20	" "	TM-419	53 (29 DL)		CB 10/29/20
11-2-20	" 6" "	TM-419	54 (6 HB)		
11-2-20	6"	TM-419	55 (7 HB)		
11-2-20	6"	TM-419	56 (8 HB)		
11-2-20	6"	TM-419	57 (9 HB)		

DATE/TIME	11-2-20 / 7:20
JOINT #	6
JOB#	312983
OPERATOR	TM-419
MODEL	PHM 26
PIPE	HDPE
OUTER PIPE	6"
INNER PIPE	N/A
FUSION TYPE	
HEATER 400-450	422°
THERMOMETER#	TMC-TI-26
CALIBRATION DATE	6-17-20
ACTUAL TEMP	
TOURQUE WRENCH #	TMC-150-04
CALIBRATION DATE	9-29-20
PREASURE (FT/LBS)	
DRAG (FT/LBS)	50
HEAT SOAK (FT/LBS)	50
FUSE (FT/LBS)	150

COMMENTS

Heat soak time - 3 minutes
Cool time - 5 minutes

DATE/TIME	11-7-20 / 8:00
JOINT #	7
JOB#	317983
OPERATOR	TRC-419
MODEL	Pitmk 26
PIPE	HDPE
OUTER PIPE	6"
INNER PIPE	N/A
FUSION TYPE	
HEATER 400-450	424°
THERMOMETER#	TMC-TI-76
CALIBRATION DATE	6-17-20
ACTUAL TEMP	
TOURQUE WRENCH #	TMC-150-04
CALIBRATION DATE	9-29-20
PREASURE (FT/LBS)	
DRAG (FT/LBS)	20
HEAT SOAK (FT/LBS)	20
FUSE (FT/LBS)	120

COMMENTS

Heat Soak time - 3 minutes
Cool time - 5 minutes

DATE/TIME	11-2-20 / 8:25
JOINT #	8
JOB#	312983
OPERATOR	TM-419
MODEL	Pitbull 26
PIPE	HDPE
OUTER PIPE	6"
INNER PIPE	N/A
FUSION TYPE	
HEATER 400-450	425°
THERMOMETER#	TMC-TE-26
CALIBRATION DATE	6-17-20
ACTUAL TEMP	
TOURQUE WRENCH #	TMC-150-04
CALIBRATION DATE	9-29-20
PREASURE (FT/LBS)	
DRAG (FT/LBS)	50
HEAT SOAK (FT/LBS)	50
FUSE (FT/LBS)	150

COMMENTS

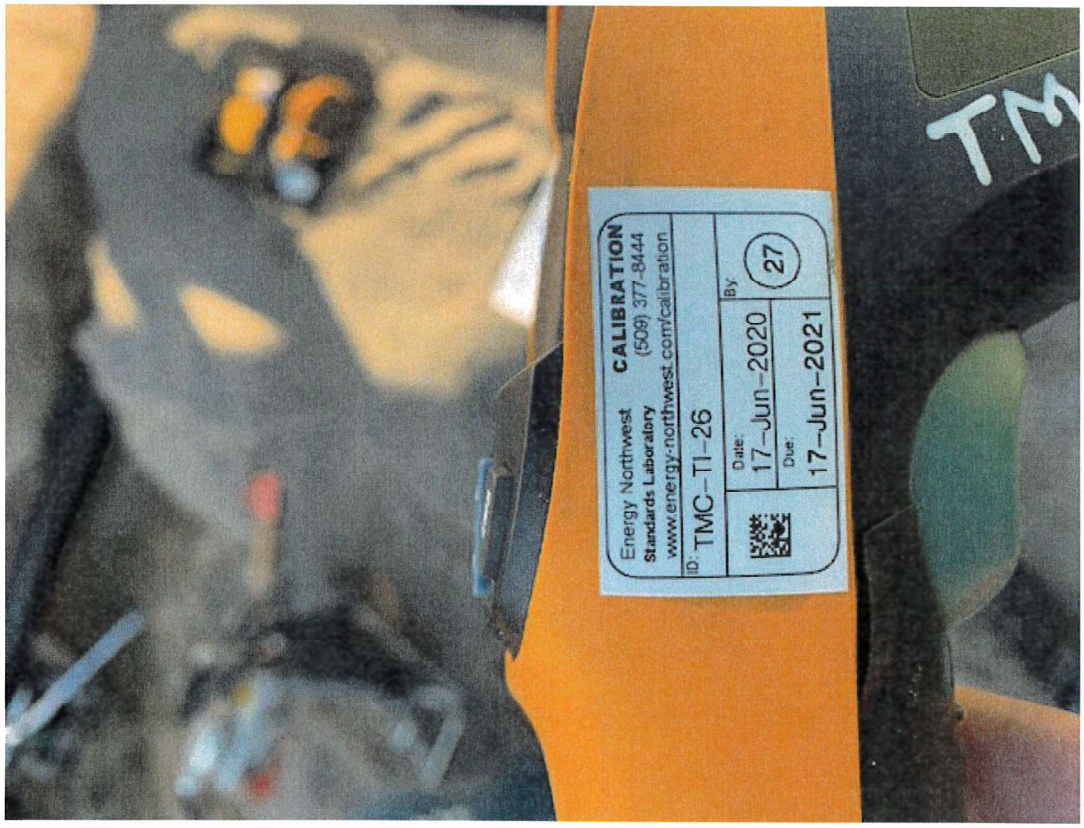
Heat Soak time - 3 minutes
Cool time - 5 minutes

DATE/TIME	11-2-20 / 9:20
JOINT #	9
JOB#	312983
OPERATOR	TM-419
MODEL	Billboll 26
PIPE	HDPE
OUTER PIPE	6"
INNER PIPE	N/A
FUSION TYPE	
HEATER 400-450	421°
THERMOMETER#	TMC-TS-26
CALIBRATION DATE	6-17-20
ACTUAL TEMP	
TOURQUE WRENCH #	TMC-150-04
CALIBRATION DATE	9-29-20
PREASURE (FT/LBS)	
DRAG (FT/LBS)	20
HEAT SOAK (FT/LBS)	20
FUSE (FT/LBS)	120

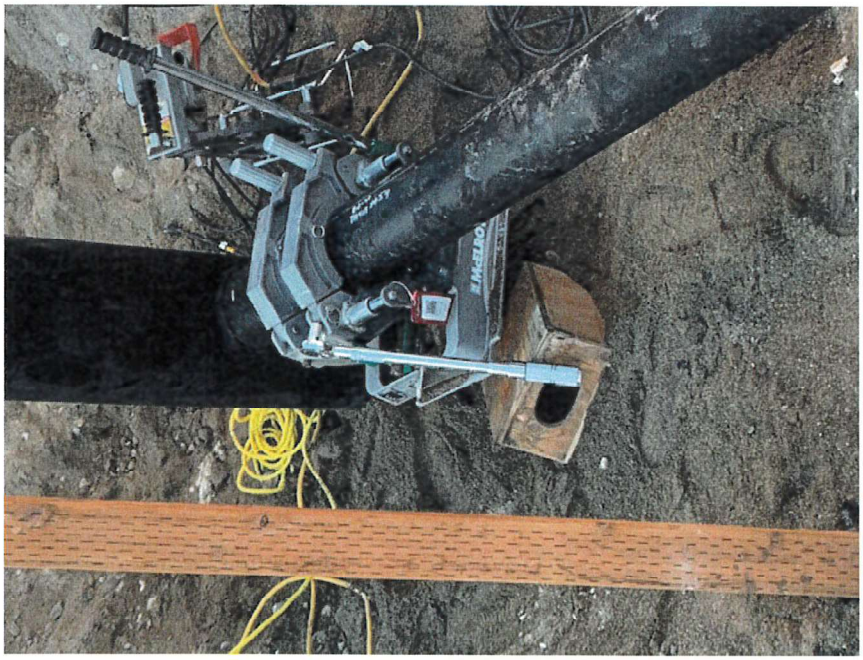
COMMENTS

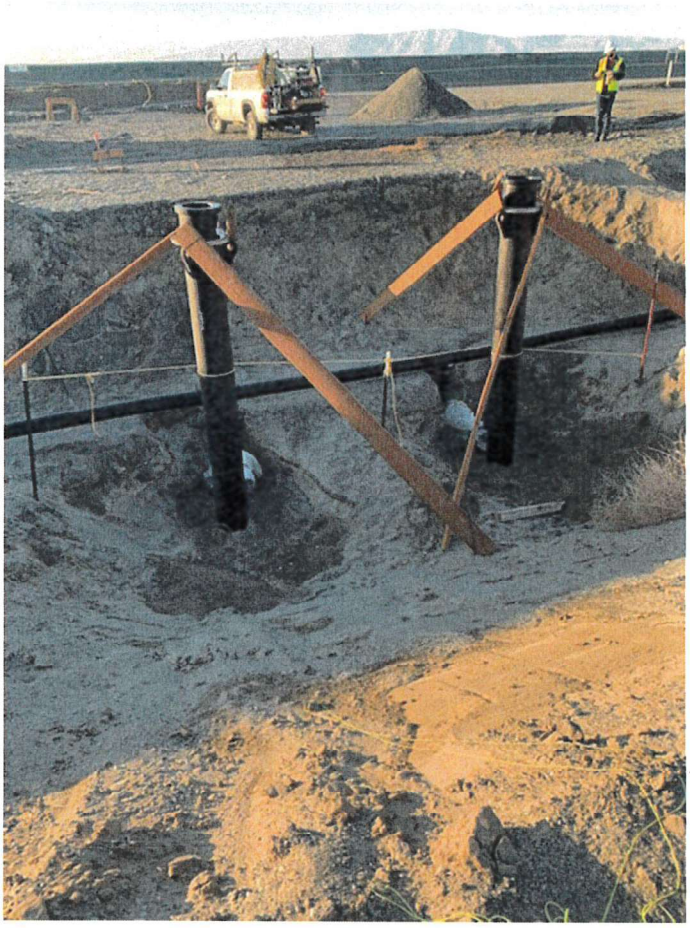
Heat soak time - 3 minutes
cool time - 5 minutes

TMC-150-04
CALIBRATION
(509) 377-8444
www.energy-northwest.com/calibration
TMC-150-04
Date:
29-Sep-2020
By:
28
Due:
29-Sep-2021


Energy Northwest
Standards Laboratory
CALIBRATION
(509) 377-8444
www.energy-northwest.com/calibration
ID: TMC-TI-26
Date:
17-Jun-2020
By:
27
Due:
17-Jun-2021

11-2-20
TM419 #54

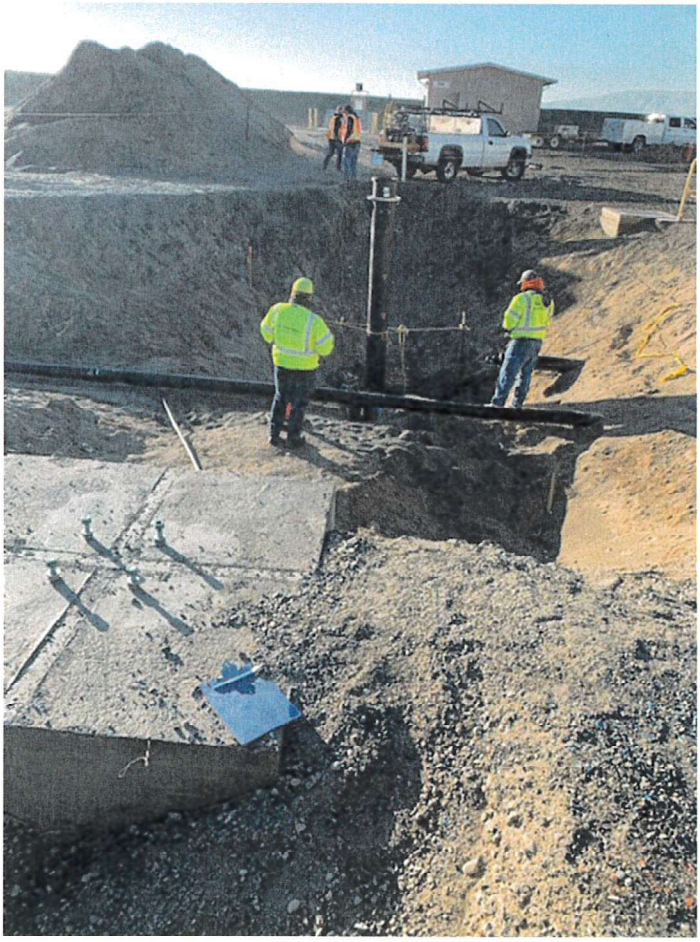




11-2-20
TM419
#55

11-2-20
TM419
#56

11-2-20
Thy 419
#57



Inspection No.: IR-332610-007	Meier Project No. 8692	Project Title: IDF Upgrades

Inspection Description: Witness the hydrostatic testing of the primary transfer line.

Contract No.: 332610

Components or System Inspected:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement.

Inspector:	Randy Saworski	Date and Time:	11/4/2020	8:30 AM

Reference Documents	Rev No.	Reference Documents	Rev No.
ECR-18-001801, *IDF Leachate Tank 219A201 and 219E201 Connection*, Page 10 & 11.	00	*IDF Infrastructure Upgrades Test Plan Order of Precedence.*	N/A
IP-332610-01, Table 3	A		

Background and Objective: Observe the hydrostatic testing of the assemblies listed below:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement.

Items checked below were inspected to ensure compliance with the requirements of 40 CFR 265 Subpart J "Tank Systems" and WAC 173-303-640 "Tanks Systems" to treat and store dangerous waste. WA Ecology Guide 94-114, "Guidance for Assessing and Certifying Tank Systems" is used for reference only.

Inspection Criteria ☐ Existing Tank System ☒ New Tank System	CFR 265.191 Existing	CFR 265.192 New	WAC Existing Tank Systems	WAC New Tank Systems	Ecology Guide 94-114
☒ Document Review					
☒ Other: Observe the hydrostatic testing of the primary transfer line listed below.					
☐ Weld breaks		(b)(1)		(3)(c)(i)	4.1
☐ Punctures		(b)(2)		(3)(c)(ii)	4.1
☐ Scrapes of protective coatings		(b)(3)		(3)(c)(iii)	4.1
☐ Cracks		(b)(4)		(3)(c)(iv)	4.1
☐ Corrosion	(b)(3)	(b)(5)		(3)(c)(v)	4.1
☐ Other structural damage or inadequate construction / installation	(a),(b)	(b)(6)		(3)(c)(vi)	4.1
☐ Placement of reinforcing steel and anchor bolts					4.1
☐ Concrete placement					4.1
☐ Subgrade and foundation preparation					4.1

☐ Placement of shop-fabricated tanks					4.1
☐ Erection of field-erected tanks					4.1
☐ Installation of secondary containment liner or vault					4.1
☐ Installation of piping, pumping, and other ancillary equipment					4.1
☐ Placement and compaction of backfill				(3)(d)	4.1
☒ Visual inspection/leak tightness/ pressure testing	(b)(5)		(2)(c)(v)	(3)(e)	4.1/4.2
☐ Ancillary equipment supports and protection	(b)(1)			(3)(f)	3.5
☐ Corrosion protection systems	(b)(3)		(2)(c)(iii)	(3)(g)	4.3

Contacts Made During Inspection		
Name	Title	Company
Tracey Kasselder	Field Work Supervisor	Fowler General Construction Inc.

Summary, Results, and Conclusions:

Inspection Requirements:

- Observe the hydrostatic testing of the primary leachate transfer line.

Inspection Results:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement:
    - Reviewed the work steps in "Test Plan Order of Precedence".
    - Observed the test setup which utilized a calibrated test pressure gauge (id TMC-300-07 Cal due 8/20/2021).
    - The 4 hour initial expansion pressure was not witnessed.
    - Observed the test pressure at 76 psig.
    - Observed the test duration at 1 hour. The pressure remained within the test requirement of +/-3.75 psi.
    - Observed the test personnel check for leaks of the secondary HDPE pipe
- No Non-Conformance Reports (NCRs) were generated during the hydrostatic testing of the primary leachate transfer line assembly.

Based on the witness of the testing and review of the documentation, no discrepancies were found. See attached selection of the reference documents and photographs.

All documents reviewed were acceptable.

QII Signature	11-16-20 Date	IQRPE Signature	11/19/2020 Date
QII Print Name: Randy Saworski		IQRPE Print Name: Paul Glever	

Intermech
An EMCOR Company

PRESSURE TEST CERTIFICATION

Report Number: 2983-02	Date: 11/4/20	Page 1 of 2
Project Number: 312983	Project Title: IDF Infrastructure upgrades	Drawing: ECR-18-001801
Acceptance Criteria: ASTM F2164		Specification: CHPRC-03953 R0 Section 33 05 05.31 3.2A thru E, 3.3.A thru D
Description: Hydro Line 219-3" -LT-052-HDPE		NCR No.: N/A

Test Preparation

Notification:		**Valve Line Up Requirements:**		
Quality Assurance:	☒	Valve ID: N/A	☐ Open	☐ Close
Client:	☒	Valve ID:	☐ Open	☐ Close
	☐	Valve ID:	☐ Open	☐ Close
	☐	Valve ID:	☐ Open	☐ Close
	☐	Valve ID:	☐ Open	☐ Close
	☐	Valve ID:	☐ Open	☐ Close

Required Test Medium: Water	**Required Test Medium Temp:** Ambient	**Soap Solution Required:** ☐ Yes ☒ No
Design System Pressure: **57.5PSI**	**Design Test Pressure:** 75 PSI +/- 5%/3.75 PSI	**Specified Hold Time:** 1 Hour
Actual Test Medium Temp: **69.5F**		

Pre-Test Checklist

Items or Requirements		Craft Release		Quality Control	
		Initials	Date	Initials	Date
Valve line-up per design requirements (see above for line-up)		JC	11/4/20	CB	11/4/20
All line or components not to be tested are properly isolated or disconnected:		JC	11/4/20	CB	11/4/20
Vents and opening checked; proper pressure relief valve installed and discharge checked:		JC	11/4/20	CB	11/4/20
Test Gauges correct range and currently calibrated					
M&TE No: TMC-TI-21 Range: 5-500F	Calibration Date: 8/25/20 Due Date: 8/25/2021	JC	11/4/20	CB	11/4/20
M&TE No: TMC-300-07 Range: 0-300PSI	Calibration Date: 8/20/20 Due Date: 8/20/21	JC	11/4/20	CB	11/4/20
M&TE No: N/A Range: N/A	Calibration Date: N/A Due Date: N/A	N/A	N/A	N/A	N/A
Pressure Relief Valves set and currently calibrated					
S/N: KIT#9 Set Point: 85 PSI	Checked Date: 11/4/20	JC	11/4/20	CB	11/4/20
S/N: N/A Set Point: N/A	Checked Date: N/A	N/A	N/A	N/A	N/A

Comments:

Initial Expansion phase started at 7:35AM and ended at 11:35AM. Pressure was maintained at 85 PSI.

Intermech
An EMCOR Company

PRESSURE TEST CERTIFICATION

Report Number: 2983-02		Page 2 of 2

Test Performance

Item or Requirement		Craft Release Initials	Craft Release Date	Quality Control Initials	Quality Control Date
Pneumatic Testing - incremental pressure (when required) Tp obtained & examination conducted under pressure	Tp= N/A	N/A	N/A	N/A	N/A
	Tp= N/A	N/A	N/A	N/A	N/A
	Tp= N/A	N/A	N/A	N/A	N/A
	Tp= N/A	N/A	N/A	N/A	N/A
	Tp= N/A	N/A	N/A	N/A	N/A
	Tp= N/A	N/A	N/A	N/A	N/A
Soap solution applied & examination conducted	Specified Tp = N/A psi	N/A	N/A	N/A	N/A
	PSI Obtained at = N/A am/pm	N/A	N/A	N/A	N/A
Refrigerant Lines -	Temperature at start of test - N/A deg. F	N/A	N/A	N/A	N/A
	Temperature at end of test - N/A deg. F	N/A	N/A	N/A	N/A
Hydrostatic testing - examination conducted under pressure	Specified Tp=. 76 PSI	JC	11/4/20	CB	11/4/20
	PSI obtained at = 11:40 AM	JC	11/4/20	CB	11/4/20
	Time at end of test: 12:40 PM	JC	11/4/20	CB	11/4/20

Pressure Test - ☑ Accepted ☐ Rejected QA/QC Signature: [signature] Date 11/4/20

Inspection Verification

Documentation properly prepared:	☑ Yes	☐ No	Actual Tp during final test: 76 Psi
All joints & welded attachments chalked/soaped as applicable:	☐ Yes	☐ No	Specified hold time attained: ☑ Yes ☐ No
All joints & welded attachments visually inspected for leakage:	☑ Yes	☐ No	
Pipe flushing performed following test, if required:	☐ Yes	☐ No	☑ N/A

Approvals

[signature] Customer Representative	11.4.20 Date
[signature] Inspector	11/4/20 Date
[signature] Contractor	11/4/20 Date

PROCUREMENT / CONTRACT SUBMITTAL
APW ☒ AP LI
a. ☒ Conforms to the Contract Documents
b. ☐ Minor Comments - Approved if no Resubmittal is requested
☐ Re-submittal required ☐ Re-submittal not required
c. ☐ Not Approved - Revise and Resubmit
Sign: Paul Branson Date: 11/03/20

IDF Infrastructure Upgrades

Test Plan Order of Precedence

Scope of work:

Intermech is submitting the following plans;

#1 Test Plan Order of precedence.
#2 Sump Leak Test.
#3, #4 Primary Carrier Line Hydro Test and P&ID.
#3, #5 Pneumatic Secondary Containment with 12" Pneumatic Sump Test and P&ID.
#6 Pressure Test Form
#7 Flush Plan

These tests are not in any order but will follow the specification requirements and documentation. All tests or Inspections will be documented by QA/QC and submitted to contract documents.
This will allow the Sump Leak test or Primary Line Hydro Test a priority if one is not available due to package or submittal issues.
Intermech Understands the contract documents and that the Sump be tested prior to tie in to Containment and the Carrier hydro tested prior to Sump and Containment test and tie in.

Intermech will perform the following steps using the following specifications during the testing.

CHPRC-03953, Rev. 0 Section 33 05 33.23
CHPRC-03953, Rev. 0 Section 33 05 05.31 3.2.A thru E, 3.3.A thru D
CHPRC-03953, Rev. 0 Section 33 05 73 3.3.1 thru 4

PROCUREMENT / CONTRACT SUBMITTAL
APPROVED APPLIED
A ☒ Conforms to Contract Requirements
B ☐ Minor Comments - Approved With Resolution as Noted
☐ Re-Submittal Required ☐ Re-Submitted Not Required
C ☐ Not Approved - Revise and Resubmit
Sign: Paul Branson Date: 11/03/20

IDF Infrastructure Upgrades

Leachate 12" Sump Test Plan

Scope of work:
Intermech has procured and had 4 Ea. 12" SDR 17 Sumps fabricated to Specification 33 05 73. All fabrications were to contract documentation and has followed manufacture recommendations to ensure a sound undamaged condition. All sumps are sitting on 95% compacted level bases and ready to be leak tested by specification 33 05 73 – 3.3.A 1-6.
All four 12" sumps are ready for leak detection on transfer Line *219-3"-LT-052-HDPE.* Two of the sumps are located approximately 16' west of buildings 219A1 and 219E1 with the other two between the two buildings approximately 350' east of building 219A1. The sumps are a fabricated item and requires a hydrostatic head pressure test prior to connecting to transfer Line *219-3"-LT-052-HDPE.*

Hydrostatic head test:
The sumps will be placed as close to location as possible and secured using tee posts and ropes. The bottom 6" branch connections will be sealed off using a rubber cap or a rubber test plug. All four of the sumps will be filled with water and start the leakage test. QA/QC will start the tests with a visual inspection and visual inspections will be performed on a regular 1-hour interval by a QA/QC designated individual. After 8 hours QA/QC will finish the tests with a final visual inspection. All Calibrated equipment and cleanliness will be documented on a test and inspection form and submitted to contract documentation.
If no leakage has occurred the water in the sumps will be drained and or pumped out allowing tie into the containment line *219-3"-LT-052-HDPE* with IQRPE witness .

PROCUREMENT / CONTRACT SUBMITTAL
APN ☒ AP ☐
A ☒ Conforms to the Contract Requirements
B ☐ Where Indicated - Approved With Comments As Noted
☐ Resubmittal Required ☐ Re-submittal Not Required
C ☐ Not Approved - Review and Resubmit
Sign: Paul Branson Date: 11/03/20

IDF Infrastructure Upgrades
Leachate Pressure Test Plan Rev 1

Scope of work:

Intermech will be installing and testing approximately 800' of new 3" SDR 11 & 6" SDR 17 Dual Wall HDPE piping for the IDF Infrastructure Upgrades project. The Piping will run from Building 219A1 to 219E1 underground with 4 branch connections to the 12" sumps for the containment piping. All piping and fittings will be installed per the project specifications.

Hydrostatic testing of HDPE carrier pipe

Line 219-3"-LT-052-HDPE
The Carrier Piping test will be approximately 800' of new 3" SDR 11 and approximately 40' of previously installed dual wall piping from inside the building. This line is inside of the 6" containment pipe at our tie in locations to each building. Test pressure for the leachate 3" HDPE will be 75 PSI (+/- 5% / 3.75 psi) maintained for 1 hour.
There is an initial expansion phase for the carrier piping of 4 hours with a maintained pressure of 85 psi. The transfer line piping will be partially back filled between numerous bonds for restraint against movement. and catastrophic failure. The line will be filled with a maximum fill velocity of 0.25 fps and vented at both buildings 219A1 and 219E1. The line will be filled with a water source (RAW Water) from site and allowed time to equalize in temperature.

Test pressure will be reached by first filling and venting the system through the existing flanged connections with test flanges and valves from inside 219A1 and 219E buildings using the raw water system or a water truck. Once the line is full and vented, a pump will then be connected to the same flanges with a test manifold, calibrated gauge and a pressure relief valve.
We will start the testing by first the 4-hour initial expansion pressure of 85 psi and then the 1-hour test of 75psi.
The test manifold will be at ground level approximately 10' above the transfer lines lowest point. After the one-hour test is completed with (+/- 5% / 3.75psi) and no visual leakage at the bonds the pressure will be relived to 0 psi. Water must stay in the carrier for the pneumatic test of the containment piping.

Pneumatic testing of HDPE containment pipe

Line 219-3"-LT-052-HDPE
The pneumatic test will be approximately 800' of new 6" SDR 17 and 40' of existing pipe. This is the containment for the 3" leachate transfer line 219-3"-LT-052-HDPE. Also included in the pneumatic test are the four 12" sumps located along the transfer line between buildings 219A1 and 219E1. The containment piping and sumps test pressure is 3.5psi with a (1psi allowable drop over 13 minutes. ASTM 1417 Table 1). The transfer line piping will remain full of water and partially back filled between numerous bonds for restraint against movement. and catastrophic failure. Test pressure will be reached by slowly introducing air into the system through one of the four sumps, the other 3 - 12" sumps will be blind flanged at the top of the sump. One sump

PROCUREMENT / CONTRACT SUBMITTAL
APM ☒ AP ☐
A ☒ Conforms to the Contract Requirements
B ☐ Minor Comments - Resubmittal With Revisions not required
☐ Resubmittal Required ☐ Resubmittal not Required
C ☐ Not Approved - Revise and Resubmit
Sign: Paul Branson Date: 11/03/20

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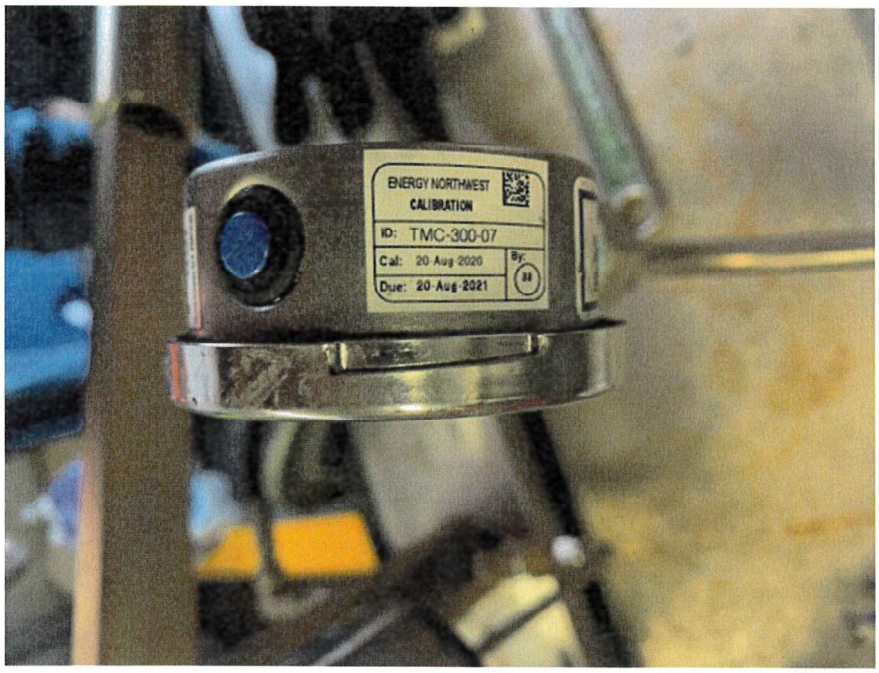
Only authorized personal will be allowed in the trench or buildings during all phases of testing.

Written by:

Russ Matheny
Supervisor
Intermech, Richland Division

Reviewed and approved by:

Scott Hanson
Project Manager
Intermech, Richland Division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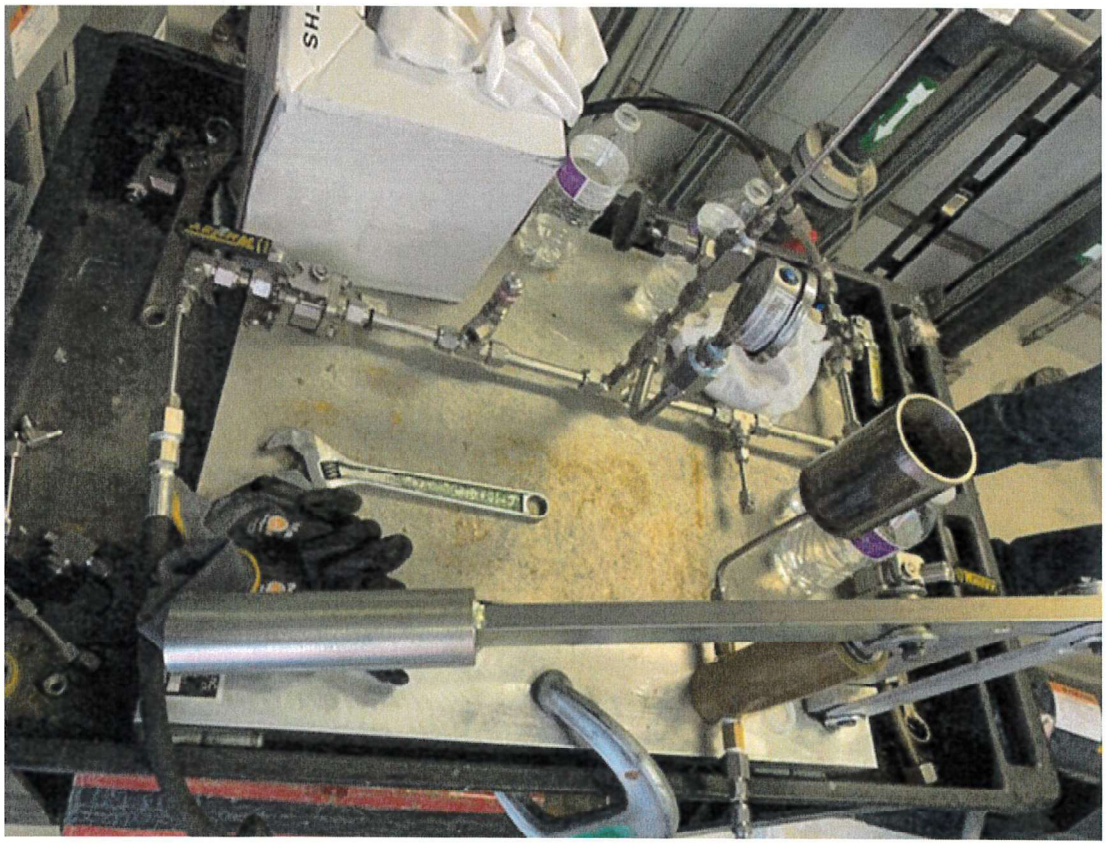
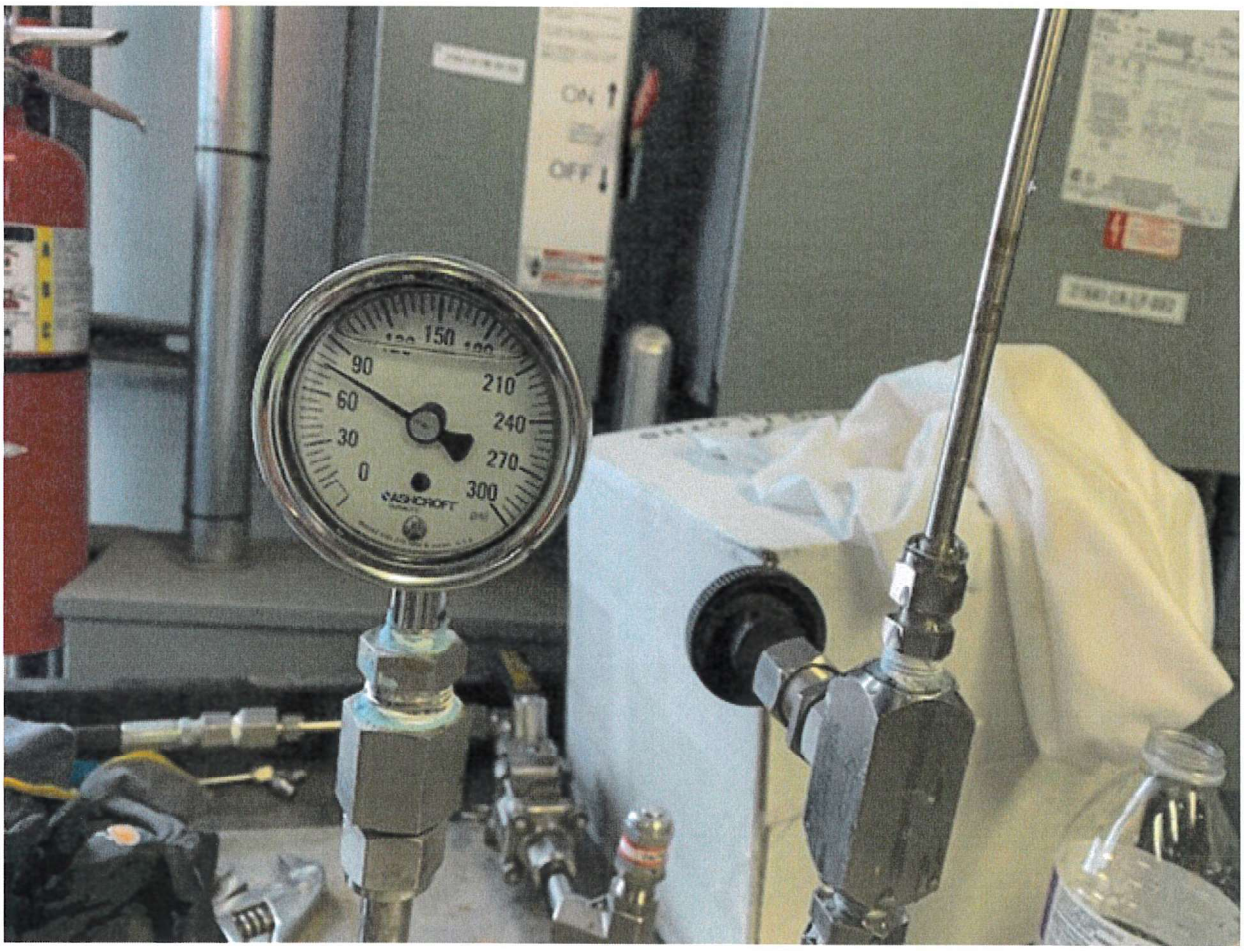
ID: TMC-300-07
Cal: 20-Aug-2020
Due: 20-Aug-2021
By:

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Inspection No.: IR-332610-008	Meier Project No. 8692	Project Title: IDF Upgrades

Inspection Description: Witness the pneumatic testing of the transfer line secondary containment.

Contract No.: 332610

Components or System Inspected:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement.

Inspector:	Randy Saworski	Date and Time:	11/5/2020	8:00 AM

Reference Documents	Rev No.	Reference Documents	Rev No.
ECR-18-001801, *IDF Leachate Tank 219A201 and 219E201 Connection*, Page 10 & 11.	00	*IDF Infrastructure Upgrades Test Plan Order of Precedence.*	N/A
IP-332610-01, Table 3	A		

Background and Objective: Observe the pneumatic testing of the assemblies listed below:

Integrated Disposal Facility:

- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement.

Items checked below were inspected to ensure compliance with the requirements of 40 CFR 265 Subpart J "Tank Systems" and WAC 173-303-640 "Tanks Systems" to treat and store dangerous waste. WA Ecology Guide 94-114, "Guidance for Assessing and Certifying Tank Systems" is used for reference only.

Inspection Criteria ☐ Existing Tank System ☒ New Tank System	CFR 265.191 Existing	CFR 265.192 New	WAC Existing Tank Systems	WAC New Tank Systems	Ecology Guide 94-114
☐ Document Review					
☒ Other: Observe the pneumatic testing of the transfer line secondary containment listed below.					
☐ Weld breaks		(b)(1)		(3)(c)(i)	4.1
☐ Punctures		(b)(2)		(3)(c)(ii)	4.1
☐ Scrapes of protective coatings		(b)(3)		(3)(c)(iii)	4.1
☐ Cracks		(b)(4)		(3)(c)(iv)	4.1
☐ Corrosion	(b)(3)	(b)(5)		(3)(c)(v)	4.1
☐ Other structural damage or inadequate construction / installation	(a),(b)	(b)(6)		(3)(c)(vi)	4.1
☐ Placement of reinforcing steel and anchor bolts					4.1
☐ Concrete placement					4.1
☐ Subgrade and foundation preparation					4.1

☐ Placement of shop-fabricated tanks					4.1
☐ Erection of field-erected tanks					4.1
☐ Installation of secondary containment liner or vault					4.1
☐ Installation of piping, pumping, and other ancillary equipment					4.1
☐ Placement and compaction of backfill				(3)(d)	4.1
☒ Visual inspection/leak tightness/ pressure testing	(b)(5)		(2)(c)(v)	(3)(e)	4.1/4.2
☐ Ancillary equipment supports and protection	(b)(1)			(3)(f)	3.5
☐ Corrosion protection systems	(b)(3)		(2)(c)(iii)	(3)(g)	4.3

Contacts Made During Inspection

Name	Title	Company
Tracey Kasselder	Field Work Supervisor	Fowler General Construction Inc.

Summary, Results, and Conclusions:

Inspection Requirements:

- Observe the pneumatic testing of the leachate transfer line secondary containment.

Inspection Results:

Integrated Disposal Facility:

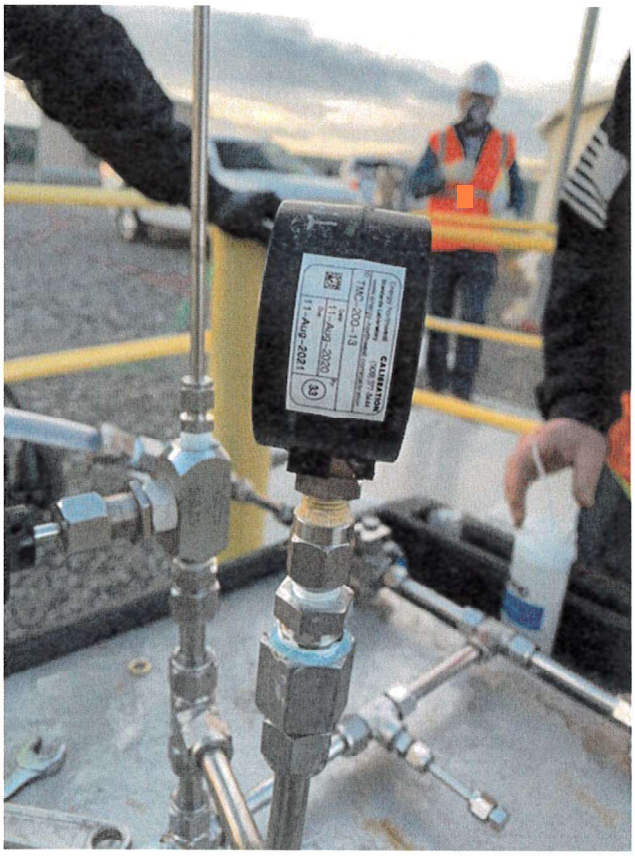
- Leachate transfer pipeline:
  - 219-3"-LT-052-HDPE w/6 encasement:
    - Reviewed the work steps in Test Plan Order of Precedence.
    - Observed the test setup which utilized a calibrated test pressure gauge (id TMC-200-13 Cal due 8/11/2021).
    - Observed the pneumatic test pressure at 3.6 psi.
    - Observed the test duration at 13 minutes.
    - Observed the test personnel check for leaks of the secondary HDPE pipe.
    - No leaks were detected.
- No Non-Conformance Reports (NCRs) were generated during the pneumatic testing of the leachate transfer line secondary containment assembly.

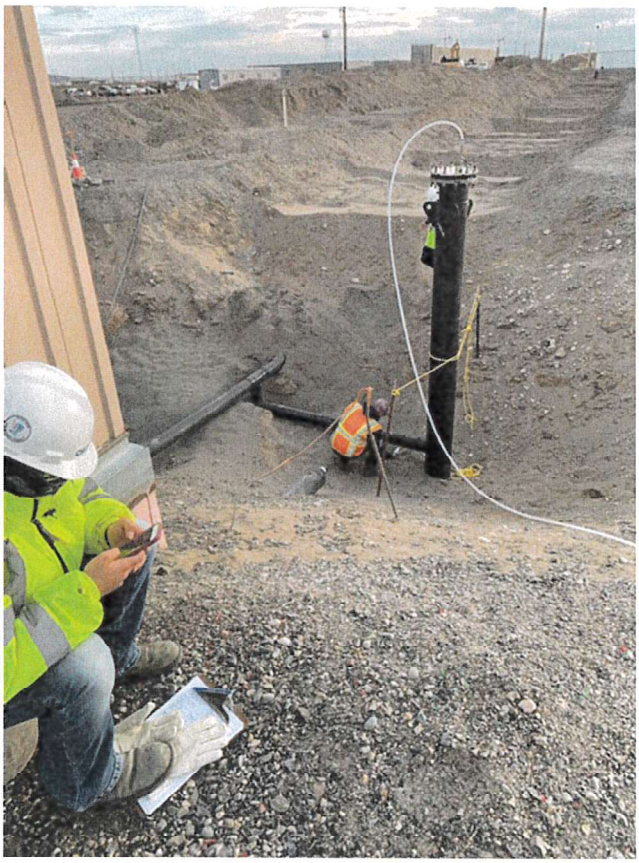
Based on the witness of the testing and review of the documentation, no discrepancies were found. See attached selection of the reference documents and photographs.

All documents reviewed were acceptable.

QII Signature	11-16-20 Date	Paul M. Giever IQRPE Signature	11/16/2020 Date
QII Print Name: Randy Saworski		IQRPE Print Name: Paul Giever	

Page 3 of 3


CALIBRATION
11-Aug-2020
11-Aug-2021



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PROCUREMENT / CONTRACT SUBMITTAL
APW M AP LI
Sign: Paul Branson Date: 11/03/20

IDF Infrastructure Upgrades

Test Plan Order of Precedence

Scope of work:

Intermech is submitting the following plans;

#1 Test Plan Order of precedence.
#2 Sump Leak Test.
#3, #4 Primary Carrier Line Hydro Test and P&ID.
#3, #5 Pneumatic Secondary Containment with 12" Pneumatic Sump Test and P&ID.
#6 Pressure Test Form
#7 Flush Plan

These tests are not in any order but will follow the specification requirements and documentation. All tests or Inspections will be documented by QA/QC and submitted to contract documents.
This will allow the Sump Leak test or Primary Line Hydro Test a priority if one is not available due to package or submittal issues.
Intermech Understands the contract documents and that the Sump be tested prior to tie in to Containment and the Carrier hydro tested prior to Sump and Containment test and tie in.

Intermech will perform the following steps using the following specifications during the testing.

CHPRC-03953, Rev. 0 Section 33 05 33.23
CHPRC-03953, Rev. 0 Section 33 05 05.31 3.2.A thru E, 3.3.A thru D
CHPRC-03953, Rev. 0 Section 33 05 73 3.3.1 thru 4

PROCUREMENT / CONTRACT SUBMITTAL
APPROVED APPLIED
Sign: Paul Branson Date: 11/03/20

IDF Infrastructure Upgrades

Leachate 12" Sump Test Plan

Scope of work:
Intermech has procured and had 4 Ea. 12" SDR 17 Sumps fabricated to Specification 33 05 73. All fabrications were to contract documentation and has followed manufacture recommendations to ensure a sound undamaged condition. All sumps are sitting on 95% compacted level bases and ready to be leak tested by specification 33 05 73 – 3.3.A 1-6.
All four 12" sumps are ready for leak detection on transfer Line *219-3"-LT-052-HDPE.* Two of the sumps are located approximately 16' west of buildings 219A1 and 219E1 with the other two between the two buildings approximately 350' east of building 219A1. The sumps are a fabricated item and requires a hydrostatic head pressure test prior to connecting to transfer Line *219-3"-LT-052-HDPE.*

Hydrostatic head test:
The sumps will be placed as close to location as possible and secured using tee posts and ropes. The bottom 6" branch connections will be sealed off using a rubber cap or a rubber test plug. All four of the sumps will be filled with water and start the leakage test. QA/QC will start the tests with a visual inspection and visual inspections will be performed on a regular 1-hour interval by a QA/QC designated individual. After 8 hours QA/QC will finish the tests with a final visual inspection. All Calibrated equipment and cleanliness will be documented on a test and inspection form and submitted to contract documentation.
If no leakage has occurred the water in the sumps will be drained and or pumped out allowing tie into the containment line *219-3"-LT-052-HDPE* with IQRPE witness .

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APN ☒ AP ☐
☐ Not Approved - Revise and Resubmit
Sign: Paul Branson Date: 11/03/20

IDF Infrastructure Upgrades
Leachate Pressure Test Plan Rev 1

Scope of work:

Intermech will be installing and testing approximately 800' of new 3" SDR 11 & 6" SDR 17 Dual Wall HDPE piping for the IDF Infrastructure Upgrades project. The Piping will run from Building 219A1 to 219E1 underground with 4 branch connections to the 12" sumps for the containment piping. All piping and fittings will be installed per the project specifications.

Hydrostatic testing of HDPE carrier pipe

Line 219-3"-LT-052-HDPE
The Carrier Piping test will be approximately 800' of new 3" SDR 11 and approximately 40' of previously installed dual wall piping from inside the building. This line is inside of the 6" containment pipe at our tie in locations to each building. Test pressure for the leachate 3" HDPE will be 75 PSI (+/- 5% / 3.75 psi) maintained for 1 hour.
There is an initial expansion phase for the carrier piping of 4 hours with a maintained pressure of 85 psi. The transfer line piping will be partially back filled between numerous bonds for restraint against movement. and catastrophic failure. The line will be filled with a maximum fill velocity of 0.25 fps and vented at both buildings 219A1 and 219E1. The line will be filled with a water source (RAW Water) from site and allowed time to equalize in temperature.

Test pressure will be reached by first filling and venting the system through the existing flanged connections with test flanges and valves from inside 219A1 and 219E buildings using the raw water system or a water truck. Once the line is full and vented, a pump will then be connected to the same flanges with a test manifold, calibrated gauge and a pressure relief valve.
We will start the testing by first the 4-hour initial expansion pressure of 85 psi and then the 1-hour test of 75psi.
The test manifold will be at ground level approximately 10' above the transfer lines lowest point. After the one-hour test is completed with (+/- 5% / 3.75psi) and no visual leakage at the bonds the pressure will be relived to 0 psi. Water must stay in the carrier for the pneumatic test of the containment piping.

Pneumatic testing of HDPE containment pipe

Line 219-3"-LT-052-HDPE
The pneumatic test will be approximately 800' of new 6" SDR 17 and 40' of existing pipe. This is the containment for the 3" leachate transfer line 219-3"-LT-052-HDPE. Also included in the pneumatic test are the four 12" sumps located along the transfer line between buildings 219A1 and 219E1. The containment piping and sumps test pressure is 3.5psi with a (1psi allowable drop over 13 minutes. ASTM 1417 Table 1). The transfer line piping will remain full of water and partially back filled between numerous bonds for restraint against movement. and catastrophic failure. Test pressure will be reached by slowly introducing air into the system through one of the four sumps, the other 3 - 12" sumps will be blind flanged at the top of the sump. One sump

PROCUREMENT / CONTRACT SUBMITTAL
APM ☒ AP ☐
A ☒ Conforms to the Contract Requirements
B ☐ Minor Comments - Approved With Noted Exceptions as Revised
☐ Re-submittal Required ☐ Re-submittal not Required
C ☐ Not Approved - Revise and Resubmit
Sign: Paul Branson Date: 11/03/20

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