



King Street Pump Station Improvements (Volume I) & ASR Lime System Improvements (Volume II) - RFCSP
Solicitation Number: CO-00670
Job No.: 20-6002
and 22-8603

ADDENDUM 4
October 30, 2023

To Respondent of Record:

This addendum, applicable to work referenced above, is an amendment to the price proposal, plans and specifications and as such will be a part of and included in the Contract Documents. Acknowledge receipt of this addendum by entering the Addendum number and issue date on the space provided in submitted copies of the Respondent Questionnaire.

RESPONSES TO QUESTIONS

- Question: I know the bid date was extended but the question deadline was not. We have a major issue that needs to be addressed if possible.**

Spec- 15076- Page 6/9, 3. "The double containment piping system shall be a Guardian prefabricated system as manufactured by IPEX, or equal"

We have been trying to deal with IPEX on this pre-fab system and they in simple terms "Do not supply a pre-fabricated type system." Ipex is a great company, but the spec is beyond there ability in our view and can't supply us an accurate quote for the system. There is no backup system to provide due the spec as written. There is basically no equal dual containment system in the market.

Response: Refer to "Changes to the Specifications" item No. 1. Requirements for containment piping have been revised to reflect availability and additional acceptable manufacturers.

- Question: As Jim said before, the specs of the project are problematic. The following are excerpts of the sections where our products are being named, and our comments are below.**

By talking to the designer we would be able to solve this issues and work on the takeoff.

Drainage systems		
	Sodium Hypochlorite	Fluoride
Carrier	DWV SCH40 PVC	DWV SCH40 PVC
Containment	DWV SCH80 PVC	DWV SCH80 CPVC
Fittings	DWV SCH40 CPVC	DWV SCH40 CPVC

Drain-Guard as manufactured by IPEX

Floor drains	
Double contained DWV PVC floor drains	
Drain-Guard as manufactured by IPEX	

Double containment "Hard" Piping		
	Sodium Hypochlorite	Fluoride
Carrier	SCH80 PVC	SCH80 PVC
Containment	SCH80 PVC	SCH80 CPVC

Fittings	SCH80 PVC	SCH80 CPVC
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Guardian as Manufactured by IPEX

Leak detection: The Leak Detection Control Panel shall be the Centra-Guard Electronic Low Point Leak Detection Control Panel, as Manufactured by IPEX. Power supply shall be 120VAC, 60 Hz

Comments:

- We can't do 4x6 Drainguard
- We don't have SCH40 CPVC DWV fittings
- Specification of drains don't match drain table in drawings
- What is "Double containment "Hard" Piping"?
- There is no such thing as PVC DWV 80 or CPVC DWV 80

Response: Refer to "Changes to the Specifications" item No. 1. Requirements for containment piping have been revised to reflect availability and additional acceptable manufacturers.

3. **Question: Section 11140: 2.02.B.7-8: Specified pump materials are not adequate to handle chlorine (4.0 mg/L) and chloride (250 mg/L) concentrations at any extended duration. We need to confirm chlorine/chloride duration and purpose in order to verify material compatibility.**

Response: Refer to "Changes to the Specifications" item No. 2. Since these pumps are raw water pumps a free chlorine residual is not expected, but the maximum chloride concentration specified could be encountered in the raw water and thus materials compatible with this concentration is required.

4. **Question: Section 11140: 2.07.B: Interior of bowls are too small to apply the Belzona coating, which must be done by hand. Please remove Belzona requirement from spec and allow porcelain lining.**

Response: Refer to "Changes to the Specifications" item No. 2. Fusion bonded epoxy lining is included as an allowable alternative.

5. **Question: Section 11110: Manufacturer is no-bidding this section. Spec/Test requirements cannot be met for the small equipment size for this application.**

Response: Refer to "Changes to the Specifications" item No. 3 and item No. 4. Testing requirements have been modified.

6. **Question: On King Street-"In spec sheet 15055-1/23 (1.01CA) under description of steel pipe, it calls for all above ground piping to be lined with fusion bond epoxy" Can we substitute the fusion bond with Tnemec Series FC22?**

Response: Refer to "Changes to the Specifications" item No. 5. Tnemec Series FC22 or equal added as an acceptable alternative to the fusion bonded epoxy lining for steel pipe.

CHANGES TO THE SPECIFICATIONS

1. SECTION 15076 DOUBLE WALL CONTAINMENT PIPING:
 - DELETE in its entirety and REPLACE with the attached SECTION 15076 DOUBLE WALL CONTAINMENT PIPING.
2. SECTION 11140 VERTICAL TURBINE PUMP:
 - ADD to the end of paragraph 2.07.B. the following language:
 - 3) Alternative No. 1: Fusion bonded epoxy, 3M Scotchkote 134/134W, 25 mils DFT.
 - DELETE sentence 2.02.B.7) in its entirety.
3. SECTION 11110 HORIZONTAL SPLIT-CASE CENTRIFUGAL PUMPS:
 - DELETE paragraphs 1.04.F.s and 1.04.F.t in their entirety.
 - DELETE paragraphs 1.06.H.2.b, 1.06.H.2.c, and 1.06.H.2.d in their entirety.
 - DELETE the period at the end of sentence 2.06.C and ADD the following language to the end of the sentence: "or sleeve-type wear rings."
 - DELETE the word, "witness" from the first sentence in paragraph 2.26.A.
 - DELETE the word, "witness" from the sentence 2.26.D.
 - DELETE the words, "3-hour" from the sentence 2.26.F.3.
 - DELETE the words, "by an independent testing laboratory" from the last sentence in paragraph 2.26.F.4.i.

4. SECTION 11313 PUMPING UNIT TESTING:

- DELETE paragraph 2.01 in its entirety.

5. SECTION 15055 STEEL PIPE (AWWA C200 MODIFIED):

- DELETE the period at the end of sentence 1.01.C.1.a) and ADD the following language to the end of the sentence: "or an approved equal to Tnemec Series FC22 100% solids epoxy lining, minimum 25 mils DFT."

END OF ADDENDUM

This Addendum, including these three (3) pages, is nine (9) pages with attachments in its entirety.

Attachments:

1. SPECIFICATIONS – SECTION 15076 DOUBLE WALL CONTAINMENT PIPING (6 pages)



Oct 30, 2023

Don Burger, P.E.
Tetra Tech

SECTION 15076

DOUBLE WALL CONTAINMENT PIPING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope of Work:

1. Furnish all labor, materials, equipment and incidentals required, and install and test the double wall containment piping, fittings and appurtenances specified herein.
2. Double wall containment piping systems are required for the hydrofluosilicic acid (fluoride) feed piping, sodium hypochlorite solution feed piping, and containment drains. The double wall containment piping shall be used when the piping is in contact with the ground, located in the trenches or overhead, or any other location indicated on the drawings.

B. Related Work Described Elsewhere:

1. Section 09900 – Painting and Coating
2. Section 15014 – Pressure Testing of Piping
3. Section 15015 – Identification for Process Piping and Valves
4. Section 15140 – Pipe Supports for Process Piping

C. General Design:

1. Double wall containment piping shall be installed in the locations as shown on the Drawings. All plastic pipe and fittings shall conform to this specification section whether provided as a part of an equipment "package" or purchased separately by the Contractor.
2. Double wall containment pipe for hydrofluosilicic acid feed piping shall consist of black Perfluoroalkoxy (PFA) tubing inside Schedule 80 chlorinated polyvinyl chloride (CPVC) conforming to this specification or in locations specifically called for on the drawings, shall be a pre-engineered double containment piping system constructed of schedule 80 CPVC.
3. Double wall containment pipe for sodium hypochlorite shall consist of PVC tubing inside schedule 80 PVC conforming to this specification or in some locations, where shown on the drawings, pre-engineered double wall piping system of Schedule 80 PVC construction.
4. Double wall chemical containment floor drains and drain piping shall be installed from the chemical feed rooms to their respective bulk storage containment areas as shown in the Drawings. Double containment drain piping shall be of schedule 40 CPVC construction for hydrofluosilicic acid and schedule 40 DWV PVC or schedule 40 PVC construction for sodium hypochlorite conforming to this specification.

1.2 QUALITY ASSURANCE

- A. All Schedule 80 CPVC and black PFA tubing double containment piping including fittings and appurtenances shall be furnished by a manufacturer who is fully experienced, reputable, and

qualified in the manufacture of the items to be furnished. The equipment shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with these Specifications.

- B. Solvent welder shall be qualified in accordance with Chapter VII of the ASME B31.3-93 Code, Part 9, Paragraph A328.
- C. Piping shall be marked with nominal size, type, class, schedule or pressure rating, manufacturer and all markings required by applicable ASTM and AWWA standards.
- D. CPVC Schedule Type: ASTM D 1784 Type I, Grade I, Class 12454-B.
- E. Piping and tubing in contact with chemicals and potable water: NSF Standard 61 certified.

1.3 SUBMITTALS

- A. Materials and shop drawings:
 - 1. Shop drawings shall be submitted to the Owner for approval in accordance with the General Requirements and Section 01300 and shall include dimensioning and the technical specification for all piping to be furnished.
 - 2. Product Data for all piping, fittings, supports, centralizers, leak detection, etc.
- B. Additional information:
 - 1. Submit to the Owner, for approval, samples of all materials specified herein, along with the manufacturer's Certificates of Inspection, descriptive literature, illustrations, specifications, installation instructions and related information.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Containment pipe and carrier tubing shall be delivered to the site in unbroken bundles packaged in such manner as to provide protection against damage. When possible, pipe should be stored at the job site in the unit packages until ready for use. Packaged units shall be handled using a fork lift or a spreader bar with fabric straps. Packaged units shall not be stacked at the job site higher than two units high.
- B. When it is necessary to store containment pipe and tubing for more than 30 days, exposure to direct sunlight shall be prevented by covering the pipe with an opaque material. Adequate air circulation above and around the pipe shall be provided as required to prevent excessive heat accumulation. Double wall containment pipe shall not be stored close to heat sources or hot objects such as heaters, fires, boilers or engine exhaust. Pipe gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. The interior and all sealing surfaces of pipe, fittings and other appurtenances shall be kept clean and free of dirt and foreign matter.
- C. Care shall be taken in handling and laying pipe and fittings to avoid severe impact blows, crushing, abrasion damage, gouging or cutting. Pipe shall be lowered, not dropped, from trucks or into trenches. All cracked, damaged or defective pipe and fittings, or any length of pipe having a gouge, scratch or other permanent indentation of more than 10 percent of the wall

thickness in depth, shall be rejected and removed at once from the work and replaced with new acceptable pipe at no additional cost to the Owner.

1.5 WARRANTY

- A. Provide product warranty in accordance with Section 01600 Material and Equipment.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All PVC and CPVC double wall containment piping system components shall be pre-engineered, factory fabricated, tested, and assembled such that field assembly is minimized to primarily that of straight joints.

2.2 MATERIALS AND EQUIPMENT

- A. Hydrofluorsilicic acid service
 - 1. Materials:
 - a. Primary carrier pipe:
 - 1) Exposed: ASTM F441 schedule 80 CPVC.
 - 2) Buried and in chemical containment boxes:
 - a) Black PFA Tubing
 - b) Wall thickness: ¼-inch, 0.047 inches and 3/8 inch to 1 inch, 0.062 inches.
 - c) 230 psi minimum pressure rating
 - b. Secondary containment pipe: ASTM F441 Schedule 80 CPVC.
 - 2. Fittings:
 - a. Primary carrier pipe:
 - 1) Exposed (solvent weld): ASTM F439 Schedule 80 CPVC.
 - 2) Exposed (threaded): ASTM F437 Schedule 80 CPVC.
 - 3) Buried and in chemical containment boxes: Flared CPVC fittings compatible with PFA tubing:
 - a) Adaptors to CPVC pipe: single barb with stainless steel clamps.
 - b) Couplings: single barb with stainless steel clamps.
 - b. Secondary containment pipe: ASTM F439 Schedule 80 solvent weld CPVC.
 - 3. Solvent Cement: ASTM F493.
 - 4. Manufacturers:
 - a. CPVC carrier and containment piping systems:
 - 1) Asahi-America, Pro-Lock
 - 2) GF Piping, Double See
 - 3) IPEX, Guardian
 - a) IPEX, Drain-Guard for DWB applications.
 - b. PFA Tubing: Chemline Plastics Unlimited or approved equal.
 - c. Fittings for PFA Tubing: FlareLINK by Fit-LINE, or approved equal.

- B. Sodium hypochlorite service
1. Materials:
 - a. Primary carrier pipe (exposed): ASTM D1785 Schedule 80 PVC.
 - b. Primary carrier pipe (buried and in containment boxes): Flexible PVC tubing with nylon braid reinforcement with smooth bore and smooth exterior.
 - 1) Minimum operating pressure rating:
 - a) $\frac{3}{4}$ inch and smaller: 200 psi.
 - b) 1 inch: 150 psi.
 - c) 1-1/4 and 1 $\frac{1}{2}$ inch: 100 psi.
 - d) 2 inch: 75 psi
 - 2) Burst pressure rating: 4.0 times operating pressure.
 - c. Secondary containment piping: ASTM D1785 Schedule 80 PVC.
 2. Fittings:
 - a. Primary carrier piping (exposed): ASTM D2467 Schedule 80 PVC.
 - b. Secondary containment piping (buried and exposed): ASTM D2467 Schedule 80 PVC.
 - c. Primary carrier piping (buried and in containment boxes):
 - 1) Adaptor to pipe: multiple barb male adaptor fitting with titanium hose clamps.
 - 2) Couplings: multiple barb male couplings with titanium hose clamps.
 3. Solvent Cement: ASTM F656 primer and ASTM D2564 solvent cement.
 4. Manufacturers:
 - a. Primary carrier piping (exposed) and secondary containment piping (exposed and buried) systems:
 - 1) Asahi-America, Pro-Lock.
 - 2) GF Piping, Double See.
 - 3) IPEX, Guardian.
 - a) IPEX, Drain-Guard for DWV applications.
 - b. Primary carrier piping (buried and in containment boxes):
 - 1) Kuriyama, Kuri-Tech Clearbraid K3130 Series BF Heavy Wall PVC Food and Beverage Hose.
 - 2) ii. Ryan-Herco, Herco-Braid Heavy Duty Food Grade Clear PVC Tubing.

2.3 ACCESSORIES

- A. Leak detection system:
1. Manufacturers:
 - a. Asahi-America, Liquid Watch II Electronic Low-Point Leak Detection System.
 - b. GF Piping, Low-Point Leak Detection System.
 - c. IPEX, Centra-Guard Electronic Low-Point Leak Detection.
 2. Leak detection sensors:
 - a. Hydrofluosilicic acid service: Polypropylene (PP) wetted parts.
 - b. Sodium hypochlorite: Perfluoroalkoxy (PFA) wetted parts.
 - c. Manufacturers:
 - 1) Flowline Switch-Tek LO10 Optical Leak Detection Switch.
 - 2) Omega LVF-200A-R Series Optical Leak Detection Switch.
 - 3) Approved equal.
 3. Design:

- a. Provide shop drawing submittal showing layout of piping and location of low-point leak detection sensors. Use plan and profile drawings or isometric drawings.
 - b. Install piping with a constant slope to low points and install leak detection switch in fitting to capture leaking fluid at all low points.
 - c. Slope buried piping to containment boxes and install leak detection switch on fitting just inside the containment box where piping enters and leaves box.
 - d. Install signal wires in accordance with the applicable Division 16 requirements to the leak detection control panel.
4. An alarm shall be sounded when liquid is sensed by sensors installed at low points. Alarm must transmit to site SCADA system for communication to operations.
 5. Centering devices: Use centering devices to center primary carrier pipe inside secondary containment pipe with openings that allow flow of leaking fluid to travel unimpeded to the low point sensors in the secondary containment pipe.

2.4 QUALITY CONTROL

- A. Factory test: Preassembled systems with primary carrier pipe installed inside secondary containment pipe shall be pretested before shipping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 1. Install containment piping system as shown on drawings and in accordance with the manufacturer's instructions for assembly.
 2. Install sufficient unions to allow for disassembly of the system for repairs and maintenance.
 3. Support valves and other equipment attached to piping with separate supports to avoid adding load to the piping system.
 4. Anchor valves in the system to prevent turning motions from inducing stress in the piping.
- B. Primary carrier pipe – PVC and CPVC
 1. Use threaded joints and threaded fittings for joining primary carrier pipe in exposed conditions.
 2. Use threaded barbed adaptors to transition between exposed piping and buried piping.
 3. Containment boxes:
 - a. Terminate the secondary containment pipe with a leak detection sensor fitting and sensor just inside the wall of the box.
 - b. Coil tubing in the box to allow for expansion and contraction.
 - c. Exceed manufacturer's recommended minimum coil radius.
 4. Connections to metal pumps and equipment:
 - a. Plastic to metal connections should be minimized and avoided if possible.
 - b. Only use reinforced male threaded PVC and CPVC fittings for connection to metal fittings on pumps and other equipment.

- C. Secondary containment pipe:
 - 1. Use solvent weld joints for secondary containment piping.
 - 2. Follow manufacturer's instructions and observe requirements for holding times.
 - 3. Do not stress joints until solvent cement has had adequate time to cure per manufacturer's instructions.
 - 4. Use solvent weld closure fittings provided by the manufacturer to facilitate complete connection and uninterrupted containment of the carrier pipe.
 - 5. Use long radius bends for buried service piping to facilitate installation and removal of flexible carrier tubing.
 - 6. Install drain fittings and valves on carrier pipe adjacent to low-point leak detection sensors.

- D. Field Painting:
 - 1. Exposed piping: paint in accordance with Section 09900 Painting and Coating.
 - 2. Colors and markings: Use color coding as indicated on the drawings and provide markings per Section 15015 Identification for Process Piping and Valves.
 - 3. Buried service: Install pipe markers as required by Section 15015 Identification for Process Piping and Valves.

3.2 INSPECTION AND TESTING

- A. Cleaning: flush all carrier and containment piping with clean water to clean piping prior to testing. Purge the annular space between the containment piping and carrier piping with clean dry air to remove moisture.

- B. Testing:
 - 1. Carrier piping: Hydrostatic test per Section 15014 Pressure Testing of Piping.
 - 2. Containment piping: Air Test per manufacturer's instructions, max pressure 5 psig.

3.3 STARTUP

- A. Provide services of manufacturer's representative to assist with unloading, testing, joint completion, and installation of the piping system and leak detection systems.

- B. Provide services of manufacturer's representative to train operators personnel in the operation and maintenance of the leak detection system, minimum 4 hours onsite.

- C. Provide services of manufacturer's representative to inspect and examine piping in accordance with ASME B31.3. Submit completed Manufacturer's Certificate of Proper Installation indicating that manufacturer's representative has inspected the installation and found it to be in compliance with manufacturer's recommendations and instructions and is fully warranted by the manufacturer.

END OF SECTION