



City of Tampa

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ADDENDUM 1

Via E-Mail

DATE: September 23, 2019

Contract: 19-C-00017 D.L. Tippin Tank Rehabilitation - Ferric and Acid Tank Rehabilitation

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

Item 1: The bid date is hereby changed to October 1, 2019.

Item 2: Replace Section 40 05 13 Common Work Results For Process Piping with the attached Section 40 05 13.

Item 3: Replace Section 09 96 35 Chemical Resistant Coatings with the attached Section 09 96 35.

Item 4: Attached for reference is a copy of the pre-bid meeting sign-in sheet.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to Contract Administration@tampagov.net.

Jim Greiner

Jim Greiner, P.E., Contract Management Supervisor

SECTION 40 05 13

COMMON WORK RESULTS FOR PROCESS PIPING

PART 1 GENERAL

1.01. DESCRIPTION OF WORK

- A. Provide the piping systems indicated, complete and operable, in accordance with the Contract Documents.
- B. The mechanical drawings define the general layout, configuration, routing, method of support, pipe size, and pipe type.
- C. The mechanical drawings are not pipe construction or fabrication drawings.
- D. Where pipe supports and spacing are indicated on the drawings and are referenced to a Standard Detail, the Contractor shall use that Detail.
- E. Where pipe supports are not indicated on the drawings, it is the Contractor's responsibility to develop the details necessary to design and construct mechanical piping systems to accommodate the specific equipment provided, and to provide spacers, adapters, and connectors for a complete and functional system.

1.02. RELATED SECTIONS

- A. Section 40 05 13.19 – Stainless Steel Process Piping
- B. Section 40 05 23 – Common work Results for Process Valves
- C. Section 40 05 23.19 – Stainless Steel Process Valves
- D. Section 43 21 43 – Sump Liquid Pumps.

1.03. REFERENCES

AWS D1.1	Structural Welding Code
ASME, Section 9	Boiler and Pressure Vessel Code
AWWA C207	Steel Pipe Flanges for Waterworks Service
ASME B16.5	Pipe Flanges and Flanged Fittings
ANSI/ASME A13.1	Pipe Labeling
ASTM A325	Structural Bolts, Steel, Heat Treated
AWWA C606	Grooved and Shouldered Joints
AWWA C219	Standard for Bolted Sleeve-Type Couplings for Plain-End Pipe
ASTM D 2000	Classification System for Rubber Products in Automotive Applications
ASTM A 512	Cold-Drawn Buttweld Carbon Steel Mechanical Tubing
ASTM A 513	Electric-Resistance Welded Carbon and Alloy Steel Mechanical Tubing
ASTM A 576	Steel Bars, Carbon, Hot Wrought, Special Quality
AISI C1012	Carbon Steel
ASME B1.20.1	Pipe Threads, General Purpose

1.04. SUBMITTALS

- A. Furnish submittals in accordance with Section 01 33 00, Submittal Procedures.
- B. Shop Drawings: Shop Drawings shall contain the following information:
 - 1. Drawings: Layout drawings including necessary dimensions, details, pipe joints, fittings, specials, bolts and nuts, gaskets, valves, appurtenances, anchors, guides, and material lists. Fabrication drawings shall indicate spacers, adapters, connectors, fittings, and pipe supports to accommodate the equipment and valves in a complete and functional system.
 - 2. Thermoplastic Pipe Joints: Submit solvent cement manufacturer's catalog indicating that the recommended product is suitable for each fluid service application.
 - 3. Gasket Material: Submit gasket manufacturer's catalog indicating that the recommended product is suitable for each fluid service application.
 - 4. Modular Seals for Pipe: Manufacturer's catalog sheet showing materials and installation procedures.
- C. Samples
 - 1. Performing and paying for sampling and testing as necessary for certifications are the Contractor's responsibility.
- D. Certifications
 - 1. The Contractor shall obtain necessary certificates, test reports, and affidavits of compliance.
 - 2. A certification from the pipe fabricator that each pipe will be manufactured subject to the fabricator's or a recognized Quality Assurance Program. An outline of the program shall be submitted to the Engineer for review prior to the manufacture of any pipe.

1.06. MATERIAL DELIVERY, STORAGE, AND PROTECTION

- A. Piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged condition and stored off the ground for protection against oxidation caused by ground contact.

- B. Piping materials, fittings, valves, and accessories shall be stored per manufacturer's recommendations.
- C. Defective or damaged materials shall be replaced with new materials.

1.07. EQUIPMENT WARRANTIES AND SPECIAL GUARANTEES

- A. The Contractor shall furnish the manufacturer's written guarantee that the piping comply with the indicated requirements.
- B. The Contractor shall furnish the manufacturer's warranties as published in its literature.

PART 2 PRODUCTS

2.01. GENERAL

- A. Extent of Work
 - 1. Pipes, fittings, and appurtenances shall be provided in accordance with the requirements as indicated in the Contract Drawings.
 - 2. Materials in contact with potable water shall be listed as compliant with NSF Standard 61.
- B. Pipe Supports
 - 1. Pipes shall be adequately supported, restrained, and anchored in accordance with Section 43 10 52 – Pipe Supports, and as indicated on the Contract Drawings.
- C. Coating
 - 1. Application, thickness, and curing of coating on buried pipe shall be in accordance with the applicable Sections of Division 09, unless otherwise indicated.
 - 2. Pipes above ground or in structures shall be coated in accordance with Section 09 96 00 – High-Performance Coatings.
- D. Pressure Rating
 - 1. Piping systems shall be designed for the maximum expected pressure as indicated on the Piping Schedule.
- E. Inspection
 - 1. Pipe shall be subject to inspection at the place of manufacture.
 - 2. During the manufacture, the Engineer shall be given access to areas where manufacturing is in progress and shall be permitted to make inspections necessary to confirm compliance with requirements.
- F. Tests
 - 1. Except where otherwise indicated, materials used in the manufacture of the pipe shall be tested in accordance with the applicable specifications and standards.

2. The Contractor shall be responsible for performing material tests.

G. Welding Requirements

1. Qualification of welding procedures used to fabricate pipe shall be in accordance with the provisions of AWS D1.1 - Structural Welding Code or the ASME Boiler and Pressure Vessel Code, Section 9, whichever is applicable.
2. Welding procedures shall be submitted for the Engineer's review.

H. Welder Qualifications

1. Welding shall be performed by skilled welders and welding operators who have adequate experience in the methods and materials to be used.
2. Welders shall be qualified under the provisions of AWS D1.1 or the ASME Boiler and Pressure Vessel Code, Section 9, whichever is applicable.
3. Machines and electrodes similar to those used in the Work shall be used in qualification tests.
4. Qualification testing of welders and materials used during testing is part of the Work.

2.02. PIPE FLANGES

- A. Flanges shall be provided with flat faces and shall be attached with bolt holes straddling the vertical axis of the pipe unless otherwise indicated.
- B. Attachment of the flanges to the pipe shall conform to the applicable requirements of AWWA C207.
- C. Flange faces shall be perpendicular to the axis of the adjoining pipe.
- D. Flanges for miscellaneous small diameter pipes shall be in accordance with the standards indicated for these pipes.
- E. Pressure Ratings
 1. 150 psig or less: Flanges shall conform to either AWWA C207 - Steel Pipe Flanges for Waterworks Service--Sizes 4 In. Through 144 In., Class D, or ASME B16.5 - Pipe Flanges and Flanged Fittings, 150 lb class.
 2. 150 psig to 275 psig: Flanges shall conform to either AWWA C207 Class E or Class F, or ASME B16.5 150 lb class.
 3. 275 psig to 700 psig: Flanges shall conform to ASME B16.5, 300 lb class.
 4. Selection Based on Test Pressure
 - a. Do not expose AWWA flanges to test pressures greater than 125 percent of rated capacity.
 - b. For higher test pressures, the next higher rated AWWA flange or an ANSI-rated flange shall be selected.

F. Blind Flanges

1. Provide blind flanges in accordance with AWWA C207, or as indicated for miscellaneous small pipes.
2. Blind flanges for pipe sizes 12 inches and greater shall be provided with lifting eyes in the form of welded or screwed eye bolts.

G. Flange Coating

1. Machined faces of metal blind flanges and pipe flanges shall be coated with a temporary rust-inhibitive coating to protect the metal until the installation is completed.

H. Flange Bolts

1. Bolts and nuts shall conform to the requirements of Section 05 50 00 – Metal Fabrications.
2. Use all-thread studs on valve flange connections where space restrictions preclude the use of regular bolts.

I. Insulating Flanges

1. Insulated flanges shall be provided with bolt holes 1/4-inch diameter greater than the bolt diameter.

J. Insulating Flange Sets

1. Provide insulating flange sets where indicated.
2. Each insulating flange set shall consist of an insulating gasket, insulating sleeves and washers, and a steel washer.
3. Insulating sleeves and washers shall be one piece when flange bolt diameter is 1-1/2 inch or smaller and shall be made of acetyl resin.
4. For bolt diameters larger than 1-1/2 inches, insulating sleeves and washers shall be 2-piece and shall be made of polyethylene or phenolic material.
5. Steel washers shall be in conformance with ASTM A 325 - Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
6. Insulating gaskets shall be full-face.

K. Insulating Flange Manufacturer, or Equal

1. JM Red Devil, Type E
2. Maloney Pipeline Products Co.
3. PSI Products, Inc.

L. Flange Gaskets

1. Gaskets for flanged joints used in general water and wastewater service shall be full-faced type, with material and thickness in accordance with AWWA C207, suitable for temperatures to 700 degrees F, a pH of one to 11, and pressures to 1000 psig.
2. Blind flanges shall be provided with gaskets covering the entire inside face of the blind flange and shall be cemented to the blind flange.
3. Ring gaskets will not be accepted unless otherwise indicated.
4. Flange gaskets shall be: John Crane, Style 2160; Garlock, Style 3000; or equal.
5. Gaskets for flanged joints used in water with chloramines shall be: Gylon, Style 3500 as manufactured by Garlock; or equal.
6. Gaskets for flanges for PVC and CPVC piping used in general water and wastewater service shall be full-faced, 1/8-inch thick, and made of ethylene propylene rubber (EPR) having a Type A durometer hardness of 50 to 70 when tested in accordance with ASTM D 2240.
7. When the mating flange has a raised face, provide a flat ring gasket filler between the PVC flange and gasket and the adjacent flange.
8. Gaskets for flanged joints used in chemicals, air, solvents, hydrocarbons, steam, chlorine and other fluids shall be made of materials compatible with the service, pressure, and temperature.

2.03. THREADED INSULATING CONNECTIONS

A. General

1. Threaded insulating bushings, unions, or couplings, as appropriate, shall be used for joining threaded pipes of dissimilar metals and for piping systems where corrosion control and cathodic protection are involved.

B. Materials

1. Threaded insulating connections shall be constructed of nylon, Teflon, polycarbonate, polyethylene, or other non-conductive materials, and shall have ratings and properties to suit the service and loading conditions.

2.04. PEX-AL-PEX (PAP) PIPING

- A. Provide PEX-AL-PEX piping and fittings where indicated on the Drawings, conforming to the requirements of ASTM F1282 and ASTM F1974.
- B. Piping shall consist of a rigid flexible aluminum core, permanently bonded to layers of durable high-density polyethylene plastic on the inner and outer layers of the pipe.
- C. Fittings shall be nickel-plated brass or stainless steel and utilize double o-ring seals.
- D. Piping shall be rated for long-term continuous operating pressures of 200 psi at 73 degrees F, and 160 psi at 140 degrees F.
- E. Piping shall be specifically designed for compressed air operation.

- F. Installation and testing shall be per manufacturer's recommended procedures.
- G. Piping and fittings shall be manufactured by Rapid Air Products, Duratec Airline System, or equal.

2.05. MECHANICAL-TYPE COUPLINGS (GROOVED OR BANDED PIPE)

A. General

1. Provide cast mechanical-type couplings where indicated, conforming to the requirements of AWWA C606 - Grooved and Shouldered Joints.
2. Bolts and nuts shall conform to the requirements of Section 05 50 00 – Metal Fabrications.
3. Gaskets for mechanical-type couplings shall be compatible with the piping service and fluid utilized, in accordance with the coupling manufacturer's recommendations.
4. The wall thickness of grooved piping shall conform to the coupling manufacturer's recommendations to suit the highest expected pressure.
5. In order to avoid excessive load on equipment caused by pipe movement due to steady state or transient pressure conditions, equipment connections with mechanical-type couplings shall be provided with rigid grooved couplings or flexible type coupling with harness in sizes where rigid type couplings are not available, unless thrust restraint is provided by other means.
6. Mechanical type couplings shall be bonded.
7. The Contractor shall have the coupling manufacturer's service representative verify the correct choice and application of couplings and gaskets, and the workmanship, to assure a correct installation.
8. In order to ensure uniform and compatible piping components, grooved fittings, couplings, and valves shall be furnished by the same manufacturer as the coupling.
9. Grooving tools shall be from the same manufacturer as the grooved components.

B. Steel Pipe Couplings Manufacturer, or Equal

1. Gustin-Bacon (Aeroquip Corp.) (banded or grooved)
2. Victaulic Style 41 or 44 (banded, flexible)
3. Victaulic Style 77 (grooved, flexible or rigid)
4. Victaulic Style 07 or HP-70 (grooved, rigid)

C. Ductile Iron Pipe Couplings Manufacturer, or Equal

1. Gustin-Bacon, (Aeroquip Corp.)
2. Victaulic Style 31 (flexible or rigid grooving)

Note: Ductile iron pipe couplings shall be provided with flush seal gaskets.

D. PVC Pipe Couplings Manufacturer, or Equal

1. Gustin-Bacon, (Aeroquip Corp)
2. Victaulic Style 775

Note: Couplings for PVC pipe shall be furnished with radius cut or standard roll grooved pipe ends.

2.06. SLEEVE-TYPE COUPLINGS

A. General

1. Provide sleeve-type couplings where indicated.
2. The Contractor will not be allowed to substitute a sleeve-split coupling or any other type in lieu of sleeve coupling unless approved by the Engineer.

B. Construction

1. Sleeve couplings shall be in accordance with AWWA C219 - Standard for Bolted Sleeve-Type Couplings for Plain-End Pipe.
2. Couplings shall be constructed of steel with steel bolts unless indicated otherwise, without pipe stop.
3. Couplings shall be of sizes to fit the indicated pipe and fittings.
4. The middle ring shall be not less than 1/4-inch thick or at least the same wall thickness as the pipe to which the coupling is connected.
5. If the strength of the middle ring material is less than the strength of the pipe material, the thickness of the middle ring shall be increased to have the same strength as the pipe.
6. The coupling shall be either 5 or 7 inches long for sizes up to and including 30-inch and 10 inches long for sizes greater than 30-inch, for standard steel couplings, and 16 inches long for long-sleeve couplings.
7. The followers shall be single-piece contoured mill sections welded and cold-expanded as required for the middle rings, and of sufficient strength to accommodate the number of bolts necessary to obtain adequate gasket pressures without excessive rolling.
8. The shape of the follower shall be of such design as to provide positive confinement of the gasket.
9. Bolts and nuts shall be in accordance with the requirements of Section 05 50 00 – Metal Fabrications.
10. Buried sleeve-type couplings shall be epoxy-coated at the factory as indicated.

C. Pipe Preparation

1. Where indicated, prepare the ends of the pipe for flexible steel couplings.

2. Plain ends for use with couplings shall be smooth and round for a distance of 12 inches from the ends of the pipe, with an outside diameter not more than 1/64 inch smaller than the nominal outside diameter of the pipe.
3. The middle ring shall be tested by cold-expanding a minimum of one percent beyond the yield point, in order to proof-test the weld to the strength of the parent metal.
4. The weld of the middle ring shall be subjected to air test for porosity.

D. Gaskets

1. Gaskets for sleeve-type couplings shall be rubber-compound material that will not deteriorate from age or exposure to air under normal storage or use conditions.
2. Gaskets for wastewater and sewerage applications shall be composed of Buna N, Grade 60, or equivalent suitable elastomer.
3. The rubber in the gasket shall meet the following specifications:
 - a. Color: jet black
 - b. Surface: non-blooming
 - c. Durometer Hardness: 74, plus and minus 5
 - d. Tensile Strength: 1000 psi minimum
 - e. Elongation: 175 percent minimum
4. The gaskets shall be immune to attack by impurities normally found in water or wastewater.
5. Gaskets shall meet the requirements of ASTM D 2000 - Classification System for Rubber Products in Automotive Applications, AA709Z, meeting Suffix B13 Grade 3, except as indicated above.
6. Where sleeve couplings are used in water containing chloramine or other fluids which attack rubber materials, gasket material shall be compatible with the piping service and fluid utilized.
7. Gasket materials used in water with chloramines shall be: Gylon Style 3500 by Garlock by Crane; or equal.

E. Piping Connection to Equipment

1. Where piping connects to mechanical equipment such as pumps, compressors, and blowers, bring the piping to the equipment connection aligned and perpendicular to the axis of the flange or fitting for which the piping is to be connected.
2. The piping shall not impose excessive stress to the equipment connection to cause misalignment of the equipment.

3. The Contractor shall assign the responsibility to the equipment manufacturer to review the piping connection to the equipment and submit any modifications to the Engineer for review.

F. Insulating Sleeve Couplings

1. Where insulating couplings are required, both ends of the coupling shall be provided with a wedge-shaped gasket which assembles over a sleeve of an insulating compound material compatible with the fluid service in order to obtain insulation of coupling metal parts from the pipe.

G. Restrained Joints

1. Sleeve-type couplings on pressure lines shall be harnessed unless thrust restraint is provided by other means.
2. Harnesses shall be designed by the pipe manufacturer in accordance with AWWA Manual M11, or as indicated.
3. Harness sets shall be designed for the maximum test pressure of the pipe in which they are installed.
4. Where harness sets are installed near the suction and discharge of the pump, harness bolts shall have zero elongation in order to prevent misalignment of the pump imparted by the thrust within the piping system.

H. Sleeve-Type Couplings Manufacturer, or Equal

1. Dresser, Style 38
2. Ford Meter Box Co., Inc., Style FC1 or FC3
3. Smith-Blair, Style 411

2.07. FLANGED COUPLING ADAPTERS AND DISMANTLING JOINTS

- A. Provide flanged coupling adapters and dismantling joints where indicated.
- B. The Contractor will not be allowed to substitute any other type in lieu of flange coupling adapter or dismantling joint unless approved by the Engineer.
- C. The coupling shall be rated as indicated.
- D. Construction
 1. Flanged coupling adapter and dismantling joint bodies shall be fabricated from steel, ASTM A 512 - Cold-Drawn Butt-weld Carbon Steel Mechanical Tubing or A 513 - Electric-Resistance Welded Carbon and Alloy Steel Mechanical Tubing with steel bolts, without pipe stop.
 2. Provide flanges in conformance with AWWA C207.
 3. Couplings shall be of sizes to fit the indicated pipe and fittings.

4. The body shall be not less than 1/4 inch thick or at least the same wall thickness as the pipe to which the coupling is connected.
5. If the strength of the body material is less than the strength of the pipe material, the thickness of the middle ring shall be increased to have the same strength as the pipe. The follower flange shall be fabricated from steel, ASTM A 576 - Steel Bars, Carbon, Hot Wrought, Special Quality or AISI C1012.
6. The shape of the follower shall be of such design as to provide positive confinement of the gasket.
7. Restraint
 - a. For flanged coupling adapters and dismantling joints installed in piping system rated for positive pressure, the coupling shall be restrained with harness bolts or tie rods.
 - b. Other means of restraining the coupling such as set screws will not be accepted.
8. Bolts and nuts shall be in accordance with the requirements of Section 05 50 00 – Metal Fabrications.
9. Buried couplings shall be epoxy-coated at the factory as indicated.

E. Gaskets

1. Gaskets for flange coupling adapters and dismantling joints shall be composed of a rubber-compound material that will not deteriorate from age or exposure to air under normal storage or use conditions.
2. Gaskets for wastewater and sewerage applications shall be composed of Buna N, Grade 60, NSF-approved, or equivalent suitable elastomer.
3. The rubber in the gasket shall meet the following specifications:
 - a. Color: jet black
 - b. Surface: non-blooming
 - c. Durometer Hardness: 74, plus and minus 5
 - d. Tensile Strength: 1000 psi minimum
 - e. Elongation: 175 percent minimum
4. The gaskets shall be immune to attack by impurities normally found in water or wastewater.
5. Gaskets shall meet the requirements of ASTM D 2000 - Classification System for Rubber Products in Automotive Applications, AA709Z, meeting Suffix B13 Grade 3, except as noted above.

6. Where flanged coupling adapters or dismantling joints are used in water containing chloramine or other fluids which attack rubber materials, the gasket material shall be compatible with the piping service and fluid utilized.
7. Gasket materials used in water with chloramines shall be: Gylon Style 3500 by Garlock by Crane; or equal.

F. Piping Connections to Equipment

1. Where piping connects to mechanical equipment such as pumps, compressors, and blowers, bring the piping to the equipment connection aligned and perpendicular to the axis of the flange or fitting for which the piping is to be connected.
2. The piping shall not impose excessive stress to the equipment connection to cause misalignment of the equipment.
3. The Contractor shall assign the responsibility to the equipment manufacturer to review the piping connection to the equipment and submit any modifications to the Engineer for review.

G. Restrained Joints

1. Flange coupling adapters on pressure lines shall be harnessed unless thrust restraint is provided by other means.
2. Harnesses shall be designed by the pipe manufacturer in accordance with AWWA Manual M11, or as indicated.
3. Harness sets shall be designed for the maximum test pressure of the pipe in which they are installed.
4. Where harness sets are installed near the suction and discharge of the pump, harness bolts shall have zero elongation in order to prevent misalignment of the pump imparted by the thrust within the piping system.

H. Manufacturer, or Equal – Flanged Coupling Adaptors

1. Smith-Blair, Model 975
2. JCM, Model 309

I. Manufacturer, or Equal – Dismantling Joint

1. Romac, Model DJ400

2.08. FLEXIBLE CONNECTORS

A. Low-Temperature

1. Flexible connectors shall be installed in piping connections to engines, blowers, compressors, and other vibrating equipment, and where indicated.
2. Flexible connectors for service temperatures up to 180 degrees F shall be flanged-reinforced neoprene or butyl spools, rated for a working pressure of 40 to 150 psig, or reinforced flanged duck and rubber, as best suited for the application.

3. Flexible connectors for service temperatures above 180 degrees F shall be flanged, braided stainless steel spools with inner, annular, corrugated stainless steel hose, rated for a minimum 150-psig working pressure, unless otherwise indicated.
 4. The connectors shall be a minimum of 9 inches long and provided with face-to-face flanges, unless otherwise indicated.
 5. The Contractor shall submit Shop Drawings and calculations.
- B. High-Temperature
1. Install flexible connectors in engine exhaust piping and where indicated.
 2. Connectors shall be sufficient to compensate for thermal expansion and contraction and to isolate vibration between the engine and the exhaust piping system.
- C. Connectors shall be stainless steel bellows-type, flanged, and rated for minimum 150 psig, 2000 degrees F.

2.09. PROCESS AIR PIPING EXPANSION JOINTS AND PIPE SUPPORT

- A. Process air piping shall be defined as any piping downstream of process air blowers, whether the use of this piping is for aeration air, air scour air or other purposes as noted on the contract documents.
- B. Process air piping shall be provided with sufficient means to compensate for such movement without exertion of undue forces to equipment or structures due to thermal expansion and contraction.
- C. The Contractor is responsible for the design of such air systems. The design must be certified by a registered professional Engineer in the state of Florida. Submit detailed calculations and manufacturer's Shop Drawings of proposed expansion joints, piping layouts, and anchors and guides, including information on materials, temperature, and pressure ratings.
- D. The Contractor is responsible for supplying and installing any and all supports, whether flexible or fixed, along with any flexible connections as required by the certified design.
- E. Expansion joints shall be suitable for a maximum operating pressure of 50 psi as required by the system, and shall have a temperature rating of 850 degrees F.
- F. Expansion joints shall have a minimum compression of 1.25 inches, and shall have ANSI class 150 flanges.
- G. Where expansion joints are required, they shall be of the metal bellows type unless, otherwise noted.
- H. Expansion joints shall be Model NLC, by Flexicraft Industries, or Equal.

2.10. EXPANSION JOINTS

- A. Piping, other than blower air piping, subject to expansion and contraction shall be provided with sufficient means to compensate for such movement without exertion of undue forces to equipment or structures, accomplished with expansion loops, bellows-type expansion joints, or sliding-type expansion joints.

- B. Expansion joints shall be provided with flanged ends and constructed of stainless steel, Monel, rubber, or other materials best suited for each individual service.
- C. Submit detailed calculations and manufacturer's Shop Drawings of proposed expansion joints, piping layouts, and anchors and guides, including information on materials, temperature, and pressure ratings.
- D. Expansion joints shall be Model 231 single arch type, by Proco Products, Inc. or Equal for SS 316L straight pipe sections of 5 - 40 feet of length and have a minimum compression of 1.4 inches. Provide double-arch type expansion joints Model 232, by Proco Products, Inc. or Equal at Area 565- Thickened Sludge Mixing Tanks, as shown in the Contract Drawings. For longer SS hot water pipe runs the Contractor is responsible for performing pipe expansion calculations and selection of appropriate expansion joint. All calculations along with shop drawings shall be submitted to the Engineer for review prior to construction. Expansion joints shall be provided with limit rods and plates. Plates and limit rods shall be as recommended by the expansion joint manufacturer. Sufficient clearance between two pipe flanges shall be provided for installation of expansion joint at nominal length with no compression or elongation to the expansion joint.
- E. Joints shall be furnished with internal liners the same material as the associated pipe. The internal lines shall be precision molded, seamless, and extends through the expansion joints body to the outer edges of both flange faces.

2.11. PIPE THREADS

- A. Pipe threads shall be in conformance with ASME B1.20.1 - Pipe Threads, General Purpose (inch), and be made up with Teflon tape unless otherwise indicated.
- B. Where indicated and where required in order to prevent flow of water or air, the passages of piping through wall sleeves and cored openings shall be sealed with modular interlocking link mechanical closures.
- C. Individual links shall be constructed of EPDM rubber, be suitable for temperatures between minus 40 and plus 250 degrees F, and be shaped to fill the annular space between the outside of the pipe and the inside of the wall sleeve or cored opening.
- D. Assemble the links using Type 316 stainless steel bolts and nuts to form a continuous rubber belt around the pipe.
- E. Pressure plates under each bolt and nut shall be fabricated of a corrosion-resistant composite material.
- F. After the seal assembly is positioned in the sleeve, tighten the bolts against the pressure plates to expand the rubber links and form the watertight seal.
- G. Sizing and installation of sleeves and assemblies shall be in accordance with the manufacturer's recommendations.
- H. Modular Mechanical Seals Manufacturer, or Equal
 - 1. Thunderline Corporation, Link-Seal

PART 3 EXECUTION

3.01. GENERAL

- A. Install piping, fittings, and appurtenances in accordance with the requirements of applicable Sections of Division Division 43.
- B. Proprietary manufactured couplings shall be installed in accordance with the coupling manufacturer's recommendation.
- C. Care shall be taken to insure that piping flanges, mechanical-type couplings, sleeve-type couplings, flexible connectors, and expansion joints are properly installed as follows:
 - 1. Gasket surfaces shall be carefully cleaned and inspected prior to making up the connection.
 - 2. Each gasket shall be centered properly on the contact surfaces.
 - 3. Connections shall be installed to prevent inducing stress to the piping system or the equipment to which the piping is connected.
 - 4. Contact surfaces for flanges, couplings, and piping ends shall be aligned parallel, concentric, and square to each axis at the piping connections.
 - 5. Flange Bolts
 - a. Flange bolts shall be initially hand-tightened with the piping connections properly aligned.
 - b. Bolts shall be tightened with a torque wrench in a staggered sequence to the AISC-recommended torque for the bolt material.
 - 6. Harness, Thrust Restraint, and Tie Rod Bolts
 - a. Harness, thrust restraint, and tie rod bolts used for sleeve couplings, flange coupling adapters, or flexible joints shall be tightened gradually and equally at diametrically opposite sides until snug, in order to prevent misalignment and to insure that all studs carry equal loads.
 - b. In order to prevent induced stress or misalignment, do not over-torque connections to adjoining pump or equipment.
 - 7. Groove ends shall be clean and free from indentations, projections, and roll marks in the area from the pipe end to the groove.
 - 8. After installation, joints shall meet the indicated leakage rate.
 - 9. Flanges shall not be deformed nor cracked.
- D. Lined Piping Systems
 - 1. The lining manufacturer shall take full responsibility for the complete, final product and its application.
 - 2. Pipe ends and joints of lined pipes at screwed flanges shall be epoxy-coated in order to assure continuous protection.

E. Core Drilling

1. Where core drilling is required for pipes passing through existing concrete, core drilling locations shall be determined by radiograph of concrete construction in order to avoid damage to embedded raceways and reinforcing bars.

F. Cleanup

1. After completion of the Work, cuttings, joining and wrapping materials, and other scattered debris shall be removed from the Site.
2. The entire piping system shall be handed over in a clean and functional condition.

END OF SECTION

SECTION 09 96 35

CHEMICAL RESISTANT COATINGS

PART 1 GENERAL

1.01. DESCRIPTION OF WORK

- A. The Contractor shall provide chemical resistant coatings and special preparation of surfaces, complete and in place, in accordance with the City standards and Contract Documents.
- B. Coated surfaces shall withstand continuous immersion in chemicals listed at the end of this Specification.

1.02. RELATED SECTIONS

- A. Section 01 10 00 – Supplementary Summary of Work Provisions.
- B. Section 03 30 00 – Cast-In-Place Concrete

1.03. REFERENCES

ASTM C722	Chemical-Resistant Resin Monolithic Surfacing
ASTM C811	Surface Preparation of Concrete for Application of Chemical-Resistant Resin Monolithic Surfacing
ASTM C1583	Tensile Strength of Concrete Surface
ASTM D570	Water Absorption of Plastics
ASTM D4263	Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM 4541	Pull-Off Strength of Coatings on Metal Surfaces
ASTM D7234	Pull-Off Strength of Coatings on Concrete Surfaces

1.04. DEFINITIONS

- A. The term “coatings”, “finishes”, or “paint” as used herein, shall include surface treatments, emulsions, enamels, paints, epoxyresins, and other protective coatings, whether used as a pretreatment, primer, intermediate coat, or finish coat.
- B. The term “DFT” means minimum dry film thickness, without any negative tolerance.

1.05. REGULATORY REQUIREMENTS

- A. The Contractor shall comply with all City standards for chemical resistant coatings coatings.

1.06. SUBMITTALS

- A. Prior to submittal, provide specification to product manufacturer to review project chemicals and to make project-specific product recommendations.
- B. Product Data - Provide manufacturer’s data on specified products, describing physical and performance characteristics.
- C. Samples - Submit two samples, minimum 3-inch x 3-inch in size illustrating color and pattern -- one sample for standard finish and the second to show non-slip characteristics for each coating system provided on the project.

- D. Manufacturer's Installation Instructions - Indicate required pre-application testing, surface preparation, primer, perimeter and joint conditions requiring special attention, non-slip treatment, top coat, and total material thicknesses.
- E. Submit qualifications statement (letter) from manufacturer stating Contractor's training, qualifications, and approved status to install products.
- F. Submit name and qualifications of manufacturer's representative(s) who will provide site inspections and oversee testing and installation of coatings.
- G. Submit brief report of slab moisture content and strength, approved by product manufacturer.
- H. Submit maintenance information.
- I. Submit manufacturer's inspection reports for surface preparation.

1.07. QUALIFICATIONS

- A. Manufacturer - Company specializing in manufacturing the products specified in this Section with minimum five years' documented experience.
- B. Applicator - Company specializing in performing the work of this Section with minimum five years' documented experience demonstrating five successful projects and a letter of approval by manufacturer.
- C. Supervisor - Trained by product manufacturer.

1.08. MANUFACTURER'S REPRESENTATIVE

- A. Manufacturer shall provide on-site representative to review all installation procedures and to inspect surface preparation.

1.09. DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original, factory-sealed containers or packages labeled with identification of contents, manufacturer's name, address, trademark, date of manufacture, specification number, batch number, color, instructions for use, and recommendations for protective measures against toxicity.
- B. Materials shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature of storage shall be maintained between 50 degrees F and 75 degrees F.
- C. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.10. ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperature required by manufacturer three days prior to, during, and minimum 24 hours after installation of materials or as required for proper curing as specified by manufacturer, whichever is longest.

1.11. WARRANTY

- A. Warranty- Include coverage against C.R.F. delamination from substrate, degradation of surface finish, and spalling.

1.12. MAINTENANCE DATA

- A. Provide maintenance procedures, recommended maintenance materials, and procedures for repairing surface.

PART 2 PRODUCTS

2.01. MANUFACTURERS

- A. Chemical Containment Areas
1. Tnemec Company, Inc.
 2. Or equal.

2.02. LINING SYSTEM

- A. Interior Concrete Chemical Containment Areas

CHEMICAL	TNEMEC
Ferric Sulfate	<ul style="list-style-type: none"> • Abrasive Blast • Series 217 Filler • Series 201 Primer (8.0 mils) • Series 239SC-MCK Base Coat (80.0 mils) • Series 239SC Saturant Coat (12.0 mils) • Series 120-5001 Top Coat (12.0 mils)
Sulfuric Acid	<ul style="list-style-type: none"> • Abrasive Blast • Series 217 Filler • Series 201 Primer (8.0 mils) • Series 239SC-MCK Base Coat (80.0 mils) • Series 239SC Saturant Coat (12.0 mils) • Series 120-5001 Top Coat (12.0 mils)

- B. Exterior Concrete Chemical Containment Areas

TNEMEC
<ul style="list-style-type: none"> • Abrasive Blast • Spall Repairs • Series 218 Surfacer/Filler • Series 156 Prime Coat (8.0 mils) • Series 156 Finish Coat (8.0 mils)

- C. All gutters, sumps, and base of walls, including around base of concrete pads, shall be reinforced with 1.5 oz. chopped strand fiberglass mat.
- D. For traffic area of chemical containment areas, floor space, and around pump pads, apply a broadcast 20/40 mesh silica aggregate, garnet, or a slip resistant additive as recommended by the manufacturer, to achieve a non-slip finish.

PART 3 EXECUTION

3.01. TESTING

- A. Complete the following tests prior to application of coatings. Test results shall be reviewed by the material manufacturer's representative and approved in writing.
 - 1. Concrete Surface strength, ASTM C1583
 - 2. Moisture Content, ASTM D4263
 - 3. Surface temperature, surface dial thermometer.

3.02. SURFACE PREPARATION

- A. New concrete shall have a light hand trowel finish; do not machine finish or burn in.
- B. New concrete shall obtain a minimum age of 28 days prior to testing, surface preparation, and application of primer.
- C. Remove substrate ridges, fins, and other irregularities by grinding.
- D. All concrete surfaces to be coated shall be cleaned using solvents, detergents, or other suitable methods to remove grease, oils, dirt, or other foreign matter. Follow with abrasive blasting to remove weak concrete and surface laitance and to provide a "tooth" for bonding. Finished surface shall have a texture of course grit (No. 80) sandpaper.
- E. At masonry and concrete surfaces, after surface prep and application of primer, fill bug holes and surface imperfections with a scratch coat epoxy or vinyl ester mortar.

3.03. INSPECTION REPORTS

- A. Prior to application of primer and again after application of scratch coat mortar, the product manufacturer's representative shall inspect surfaces and submit a brief report with required corrections and/or approval.

3.04. INSTALLATION

- A. Follow manufacturer's instructions for surface preparation, application of coatings, curing, and non-slip aggregates.
- B. Unless otherwise stated by the product manufacturer, surfaces shall be dry prior to application of primer or coatings.
- C. Mix and spray apply each coat of resinous lining system in compliance with manufacturer's directions to produce a uniform, monolithic surface of specified thickness.
- D. At base of all walls, inside sumps, and at gutters, install fiberglass reinforcement. Press material into a wet resin base. After fiberglass is smoothed and fully embedded, saturate with additional resin.
- E. Provide 1-inch radius at all horizontal to vertical transitions.
- F. Apply multi-coats as required to achieve a minimum final thickness.
- G. Finish to smooth or non-slip level surface without open areas, cracks or voids.
- H. Coating to extend over floor, pump pads, tank pad, and on vertical surface of containment wall.

3.05. PROTECTION OF FINISHED WORK

- A. Barricade area to protect coating until cured.

3.06. CHEMICALS

- A. The following is a list of chemicals that may spill and subject the CRF to continuous immersion for an indefinite time period:

STRUCTURE	CHEMICAL	% OF CONCENTRATION
Ferric Sulfate Tank #2 Containment Area, Ferric Sulfate tank #1 and #3 Containment Area	Ferric Sulfate	N/A
Sulfuric Acid Containment Area	Sulfuric Acid	93

3.07. APPLICATION SCHEDULE

- A. Chemical Containment Areas
 - 1. Ferric Sulfate
 - a. Ferric Sulfate Tank #2 Containment Area: floor, equipment pads, and inside face of walls to the top of the containment wall.
 - b. Ferric Sulfate Tank #1 and #3 Containment Area: floor, equipment pads, and inside face of walls to the top of the containment wall.

2. Sulfuric Acid

- a. Sulfuric Acid Containment Area: floor, equipment pads, and inside face of walls to the top of the containment wall.

END OF SECTION

CONTRACT 19-C-00017;D.L. Tippin Tank Rehabilitation - Ferric and Acid Tank Rehabilitation / Pre-Bid Mtg. September 10, 2019; 10:30am (On Site)

E-Mail to Register as a Plan Holder and E-Mail All Questions to: ContractAdministration@tampagov.net

Sign-In Sheet Please Print

City of Tampa, Contract Administration Department

	Name	Organization	E-Mail OR Phone
1	Jim Greiner	Tampa Contract Administration Dept.	Jim.Greiner@tampagov.net
2	Debbie Holloway	Poole & Kent	DAVE b e p k Florida. com
3	JILLIAN HOWARD	COT CONTRACT ADMIN	JILLIAN. HOWARD@TAMPAGOV. NET
4	NISERU PATEL	WATER ENG. NISERU PATEL@TAM	NISERU.PATEL-TAMPA.GOV.NET
5	Chad Holmes	Tnemec	cholmes@tnemec.com
6	Terry Sanson	Brand Safway	tsanson@brandsafway.com
7	Machari Clayborne	Brand Safway	mclayborne@brandsafway.com
8	Tom Howe	United Rentals Fluid Sol.	t.howe@ur.com
9	RUSSELL COX	BRAND SAFWAY	RCOX2@BRANDSAFWAY.COM
10	Robert Samuelson	"	rsamuelson@ " "
11	Dana Tallman	GHD	dana.tallman@ghd.com
12	Sean Snow	GHD	Sean.Snow@ghd.com
13	Larry Muzia	Exceltech	LM@EXCELCOATINGS.COM
14	Ira Mellies	MIS	
15	Kevin Bell	Harrington	kbell@h.p.c.e.com
16	Justin Stancil	E+D Contracting	dssteel,jstancil@gmail.com
17	John Babuka	Reliable Electric	John@Reliableelectricusa.com
18	Joey Myers	Bearing Point Construction	Joey@BPCFL.com 305-793-0196
19	Justin Schutte	Bearing Point Construction	JustinS@BPCFL.com
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