



McMullen Tank Control Valve & Yard Piping Improvements
Solicitation Number: CO-00172-SM
Job No.: 18-6005

ADDENDUM 4
March 26, 2019

To Bidder of Record:

This addendum, applicable to work referenced above, is an amendment to the bid 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 bid proposal.

CHANGES TO SPECIFICATIONS

1. Attached Specification Section 2617 "Steel Pipe" is added to contract documents
2. Attached Specification Section 15080 "Piping and Valve Insulation is added to contract documents
3. Remove and replace Invitation to Bidders in its entirety and replace with the revised version attached to this Addendum.

CHANGES TO THE PLANS

1. Sheet C-02, Add following note to Notes:

"4. Welded pipe fittings may be substituted for flanged fittings."

CLARIFICATIONS

1. Changes to Specifications number 3-Bid Opening moved forward to March 29, 2019 at 2:00 PM in CR-C137 in Invitation to Bidders

END OF ADDENDUM

This Addendum, including this page, is fourteen (14) pages with attachments in its entirety.

- Attachments:
- Specification 02617 – Steel Pipe
 - Specification 15080 – Piping and Valve Insulation
 - Invitation to Bidders



Ernest T. Maestas
3/26/2019

Ernest T. Maestas
Maestas & Associates, LLC

SECTION 02617

STEEL PIPE

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. Furnish labor, materials, equipment and incidentals necessary to install steel pipe, fittings and specials for non-buried applications as specified and required for the proper installation and function of the pipe.

1.02 STANDARDS:

- A. Except as modified or supplemented herein, the steel pipe, coating and specials shall conform to the applicable requirements of the following standard specifications, latest edition:

ANSI/NSF	Standard 61
AWWA C200	"Steel Water Pipe 6 Inches and Larger"
AWWA C206	"Field Welding of Steel Water Pipe"
AWWA C207	"Steel Pipe Flanges for Waterworks Service - Sizes 4 Inches thru 144 Inches"
AWWA C208	"Dimensions for Steel Water Pipe Fittings"
ANSI/AWWA C218	Standard for Coating the Exterior of Aboveground Steel Water Pipelines and Fittings
ANSI/AWWA C219	Standard for Bolted Sleeve-Type Couplings for Plain-End Pipe
AWWA M11	Manual: "Steel Pipe - A Guide for Design and Installation"
ASTM E165	"Practice for Liquid Penetrant Inspection Method"
SSPC-SP-1	Steel Structures Painting Council - Solvent Cleaning
SSPC-SP-10	Steel Structures Painting Council - Near-White Blast Cleaning
SSPC-PA2	Steel Structures Painting Council - Measurement of Dry Paint Thickness with Magnetic Gages
SSPC-PA	Steel Structures Painting Council - A Guide to Safety /Guide 3 in Paint Application
SSPC-PS	Steel Structures Painting Council - A Guide for /Guide 17 Selecting Urethane Painting Systems
ASTM D16	"Paint, Varnish, Lacquer, and Related Products"
ASME Section V	Nondestructive Testing Examination

ASME Section IX Welding and Brazing Qualification

1.03 COORDINATION:

- A. Review installation procedures under this and other Sections and coordinate installation of items that must be installed with or before exposed piping Work.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with requirements and recommendations of authorities having jurisdiction over the Work, including:
 - a. Texas Commission on Environmental Quality.

1.05 SUBMITTALS

- A. Action Submittals: Submit the following:
 - 1. Shop Drawings:
 - a. Detailed drawings in plan and, as applicable, section.
 - b. Details of piping, valves, supports, accessories, specials, joints, harnessing, and main anchor supports, and connections to existing piping
 - 2. Testing Plans, Procedures, and Testing Limitations
 - a. Submit description of proposed testing methods, procedures, and apparatus, and obtain ENGINEER's approval prior to testing.
- B. Informational Submittals: Submit the following:
 - 1. Certificates:
 - a. Submit a certificate, signed by manufacturer of each product, certifying that product complies with applicable referenced standards.
 - b. Welder's certificate.
 - 2. Source Quality Control Submittals:
 - a. Submit copies of testing report for each test.
- C. Closeout Submittals: Submit the following:
 - 1. Record Documentation:
 - a. Maintain accurate and up-to-date record documents showing field and Shop Drawing modifications. Record documents for exposed piping Work shall show actual location of all piping and appurtenances on a copy of the Drawings, unless otherwise approved by ENGINEER.
 - b. Record documents shall show piping with elevations referenced to the project datum and dimensions from permanent structures. For straight runs of pipe provide offset dimensions as required to document pipe location.
 - c. Include section drawings with exposed piping record documents when the Contract Documents include section Drawings.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Delivery:
 - 1. Deliver products to Site to ensure uninterrupted progress of the Work.
 - 2. Upon delivery, inspect pipe and appurtenances for cracked, gouged, chipped, dented, and other damage and immediately remove damaged products from Site.

- B. Storage:
 - 1. Store products for convenient access for inspection and identification. Store products off the ground using pallets, platforms, or other supports. Protect packaged products from corrosion and deterioration.
- C. Handling:
 - 1. Handle pipe, fittings, specials, and accessories carefully with approved handling devices. Do not drop or roll material of delivery vehicles. Do not otherwise drop, roll, or skid piping.
 - 2. Avoid unnecessary handling of pipe.
 - 3. Keep pipe interiors free of dirt and foreign matter.
 - 4. Protect interior linings and exterior coatings of pipe and fittings from damage. Replace pipe and fittings with damaged lining regardless of cause of damage. Repair damaged coatings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All steel piping shall be coated and lined as indicated below:
 - 1. Interior Lining: all piping shall be lined with epoxy.
 - 2. Exterior Coating: All above ground steel pipe shall be coated with an epoxy primer and painted as per Section 3.05.
- B. Markings and Identification:
 - 1. Pipe Markings:
 - a. Clearly mark each piece of pipe or fitting with a designation conforming to that shown on the approved Shop Drawings.
 - b. Manufacturer shall cast or paint on each length of pipe and each fitting the pipe material, diameter, and pressure or thickness class.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine conditions under which the Work is to be installed and notify ENGINEER in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. General:
 - 1. Install piping as shown, specified and as recommended by the pipe and fittings manufacturer.
 - 2. If there is a conflict between manufacturer's recommendations and the Contract Documents, request in writing instructions from ENGINEER before proceeding.
 - 3. Provide pipe manufacturer's installation specialist at Site as specified on this Section.
- B. Temporary Blind Flanges, Plugs, Caps, and Bulkheads:

1. Temporarily plug installed pipe at the end of each day of work or other interruption of pipe installation to prevent entry of animals, liquids, and persons into pipe, and entrance or insertion of deleterious materials into pipe.
 2. Install standard plugs in all bells at dead ends, tees, and crosses. Cap all spigot and plain ends.
 3. Fully secure and block blind flanges, plugs, caps, and bulkheads installed for testing, designed to withstand specified test pressure.
 4. Where plugging is required for phasing of Work or subsequent connection of piping, install watertight, permanent type blind flanges, plugs, caps, or bulkhead acceptable to ENGINEER.
- C. Piping Installation:
1. Conform to manufacturer's instructions and requirements of standards and manuals listed in this Section, as applicable:
 - a. Ductile Iron Pipe: ANSI/AWWA C600, AWWA M41.
 - b. Steel Pipe: ASME B31.3, ANSI/AWWA C206, AWWA M11.
 2. Install straight runs true to line and elevation.
 3. Install vertical pipe truly plumb in all directions.
 4. Install piping parallel or perpendicular to walls of structures. Piping at angles and 45 degree runs across corners of structures will not be accepted unless specifically shown on the Contract Documents or approved by the ENGINEER.
 5. Protect and keep clean fittings, valves and pipes that will convey potable water designated by ENGINEER.
 6. Cutting: Cut pipe from measurements verified at Site. Field cut pipe, where required, with a machine specially designed for cutting type of pipe being installed. Make cuts carefully without damage to pipe, coating, or lining, and with a smooth end at right angles to axis of pipe. Cut ends of push-on joint type pipe shall be tapered and sharp edges filed off smooth. Do not flame-cut pipe.
- D. Jointing Pipe:
1. General:
 - a. Make joints in accordance with pipe manufacturer's recommendations and Contract Documents.
 - b. Cut piping accurately and squarely and install without forcing or springing.
 - c. Ream out pipes and tubing to full inside diameter after cutting. Remove all sharp edges on end cuts.
 - d. Remove all cuttings and foreign matter from inside of pipe and tubing before installation. Thoroughly clean all pipe, fittings, valves, specials, and accessories before installing.
 2. Ductile Iron and Steel Flanged Joints:
 - a. Assemble flanged joints using ring-type gaskets, with thickness as recommended by pipe manufacturer but not less than 1/8-inch thick, for raised-face flanges. Use full-face gaskets for flat-face flanges, unless otherwise approved by ENGINEER or recommended by pipe manufacturer. Gaskets shall be suitable for the service intended in accordance with the manufacturer's ratings and instructions. Gaskets shall be properly centered.
 - b. Tighten bolts in a sequence that provides equal distribution of bolt loads.
 - c. Length of bolts shall be uniform. Bolts shall not project beyond the nut more than 1/4-inch or fall short of the nut when fully taken up. Machine-cut ends of bolts to be neatly rounded. Do not use washers.

- d. Prior to assembly of flanged joints, lubricate bolt threads and gasket faces.
 - e. Alternately tighten bolts 180 degrees apart to compress the gasket evenly.
 - f. After assembly, coat all bolts and nuts, except stainless steel bolts and nuts, with same coating specified in Section 09911, Painting, for material of pipe and fittings being joined.
 - g. Dielectric fittings and Dielectric coupling shall be provided between dissimilar metals and between new and old piping.
3. Field Welded Steel Pipe Joints:
- a. Joints in steel pipe shall be butt welded or lap welded, except that flexible couplings, mechanical couplings, or flanged connections shall be provided at connections to valves, meters, and similar equipment, and where shown or specified.
 - b. Welding procedures and welder qualifications shall conform to ASME Boiler and Pressure Vessel Code Section IX or to American Welding Society Structural Welding Code D1.1/D1.1M, Section 5, whichever is required. Welding of steel water pipe shall conform to the requirements of AWWA C206.
 - c. For all piping, submit current certificates that all welders and welding operators have been qualified in accordance with ASME Boiler and Pressure Vessel Code Section IX or American Welding Society Structural Welding Code D1.1/D1.1M, Section 5, whichever is required.
 - d. Conform to field welding procedures recommended by pipe manufacturer and as specified herein.
 - e. Clean ends to be welded up to at least 1/2-inch beyond the estimated toe of weld by sandblasting or other means to remove surface contamination such as paint, oil, grease, scale, oxide, rust, and other contamination.
 - f. Verify that ends to be welded are adequately prepared in shop for welding.
 - g. Provide full penetration welds, free of cracks, overlap and cold laps.
 - h. Preheat and interpass temperatures shall be not less than 60 degrees F and not more than 350 degrees F, respectively.
 - i. Limit on Undercut: 1/32-inch or ten percent of base metal thickness, whichever is less.
 - j. For pipe wall thickness up to 11-gauge (0.125-inch) use GTAW (Gas Tungsten Arc Welding).
 - k. For pipe wall thickness greater than 11-gauge, use GTAW root pass followed by GMAW (Gas Metal Arc Welding) or SMAW (Shielded Metal Arc Welding) Cap.
 - l. Provide internal inert gas purge to exclude atmosphere.
 - m. Filler Wire: ELC grade, of matching composition or of higher molybdenum content.
 - n. Weld Thickness: Equal to or greater than parent metal. Strength of welded joints shall be equal to or greater than strength of pipes being joined.
 - o. All welds shall be smooth with an internal crown of 1/16-inch or less, and external crown of 3/32-inch or less.
 - p. For grinding operations, use iron-free grinding wheels.
 - q. After welding, joint and the surrounding damaged or uncoated area shall be coated with same coating and thickness as shop applied coating.
 - r. Tack Welds: Make tack welds when required to aid in joining, with same grade of filler metal as for finished welds. For finish welding, either completely remove tack

welds or grind starting and finishing ends of tack welds for incorporation into finished welds.

- s. Clean and de-scale all welds per ASTM A380.
- 4. Mechanical Coupling Joints:
 - a. Mechanical couplings include: sleeve-type flexible couplings, split flexible couplings, ANSI/AWWA C606 grooved or shouldered end couplings, plasticized PVC couplings, and other mechanical couplings used.
 - b. Prior to installing and assembling mechanical couplings, thoroughly clean joint ends with a wire brush to remove foreign matter.
 - c. For mechanical couplings that incorporate gaskets, after cleaning apply lubricant to rubber gasket or inside of coupling housing and to joint ends. After lubrication, install gasket around joint end of previously installed piece and mate joint end of subsequent piece to installed piece. Position gasket and place coupling housing around gasket and over grooved or shouldered joint ends. Insert bolts and install nuts tightly by hand. Tighten bolts uniformly to produce an equal pressure on all parts of housing. When housing clamps meet metal to metal, joint is complete and further tightening is not required.
- E. Installing Valves and Accessories:
 - 1. Provide supports for large valves, flow meters, and other heavy items as shown or required to prevent strain on adjoining piping.
 - 2. Position flow measuring devices in pipe lines so that they have the amount of straight upstream and downstream runs recommended by the flow measuring device manufacturer, unless specific location dimensions are shown.
 - 3. Position swing check valves and butterfly valves so that they do not conflict with upstream and downstream elements of the piping system.
- F. Transitions from One Type of Pipe to Another:
 - 1. Provide all necessary adapters, specials, and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.
- G. Closures:
 - 1. Provide closure pieces, such as blind flanges and caps, shown or required to complete the Work.

3.03 THRUST RESTRAINT

- A. Provide thrust restraint on all pressure piping systems and where otherwise shown or specified.
- B. Thrust restraints shall be designed for axial thrust exerted by test pressure specified in the Exposed Piping Schedule at end of this Section.
- C. Restrained Pipe Joints:
 - 1. Pipe joints shall be restrained by means suitable for the type of pipe being installed.
 - a. Ductile Iron, Push-on Joints and Mechanical Joints: Restrain with a proprietary restrained joint system approved by ENGINEER. Restrain ductile iron pipe connected by flexible couplings or flanged coupling adapters by harnessing across the coupling or adapter using tie rods or extended bolts connecting between flanges.
 - b. Steel Pipe Joints: Provide butt-welded joints, lap welded joints, flanged joints, or mechanical coupling connections as shown and specified in Exposed Piping

Schedule. Provide tie rods connected to lugs welded to the steel pipe for restraint at mechanical couplings.

3.04 WORK AFFECTING EXISTING PIPING

A. Location of Existing Piping:

1. Locations of existing piping shown on Drawings is approximate.
2. Determine the true location of existing piping to which connections are to be made, crossed, and that could be disturbed, and determine location of other facilities that could be affected by the Work.

B. Work on Existing Pipelines:

1. Cut or tap pipes as shown or required with machines and tools specifically designed for cutting or tapping pipelines.
2. Install temporary plugs to prevent entry of mud, dirt, water, and debris into pipe.
3. Provide necessary adapters, sleeves, fittings, pipe, and appurtenances required to complete the Work.

3.05 PAINTING

A. Interior/Exterior Equipment, Pumps, Motors, Valves and Piping

1. Maximum and minimum DFT shall be per the supplied Coating Manufacturer's printed requirements and as required by this specification.
2. Finish Coat Colors:
 - a. Potable water piping and valves - Pantone #284C
 - b. Valve hand wheels – Red.
 - c. Finish coat shall be high gloss.
3. Surface Preparation:
 - a. Uncoated Pipe - NACE No. 3/SSPC-SP 6 – Commercial Blast Cleaning.
 - b. Prime coat over shop applied primers: Prepare per the coating manufacturer's written directions.
 - c. Existing Pipe and valves:
 - 1) Prior to surface preparation, Contractor must take an inventory and document the locations of signs/nameplates/labels/pipe insulation, etc. by photograph and replace items after coating operations are completed. Each photograph must be clearly labeled to define the location of each item. No surface preparation will be allowed prior to approval of inventory documentation.
 - 2) SSPC SP1 "Solvent Cleaning" – Solvent Clean and High-Pressure Water Wash prior to abrasive blasting or coating removal. All oil, grease and other contaminants must be completely removed prior to existing coating removal. Protect electrical, vents, equipment, motors, etc. from water, solvent and spray. Damage to equipment will be the Contractor's responsibility.
 - 3) SSPC-SP3 "Power Tool Cleaning" & SSPC-SP6 "Commercial Blast Cleaning" – Contractor to remove existing coatings by a combination of the methods indicated with vacuum attachments. Care around glands, electrical equipment, fittings, and other critical or fragile areas that may be damaged by abrasives must be cleaned by Method SP3. Alternative surface preparation methods must be approved by the Engineer prior to use. Protect electrical, vents, equipment, motors, etc. from abrasives, debris, etc. Damage to

equipment will be the Contractor's responsibility.

- d. Surface profile shall be in accordance with coating manufacturer's printed requirements.
 - e. Weld profiles shall conform to NACE RP0178, Profile 'D'. Surface Preparation:
4. Application Method(s): Spray or brush. Brush shall be used for touch up and stripe coating.
5. Three-coat system to be one of the following and of the same Manufacturer of all other coating products used on this project:
- a. Sherwin-Williams

Coat	Product	DFT (mils)	Color
Prime Coat:	Epoxy Mastic II	5 – 10 mils	Aluminum
Stripe Coat:	Macropoxy 646		Beige
Intermediate Coat:	Macropoxy 646	5 – 10 mils	Beige
Finish Coat:	Hi-Solids Polyurethane	3 – 5 mils	Per 3.05.A.2
Minimum and Maximum DFT for System		13 – 25 mils	

- b. Carboline

Coat	Product	DFT (mils)	Color
Prime Coat:	Carbomastic 15	4 – 6 mils	Aluminum
Stripe Coat:	Carboguard 60		Beige
Intermediate Coat:	Carboguard 60	4 – 6 mils	Beige
Finish Coat:	Carbothane 134HG	2 - 4 mils	Per 3.05.A.2
Minimum and Maximum DFT for System		10 – 16 mils	

- c. PPG

Coat	Product	DFT (mils)	Color
Prime Coat:	Amerlock 2/400 AL	5 – 6 mils	Aluminum
Stripe Coat:			Beige
Intermediate Coat:	Amerlock 2/400	5 – 6 mils	Beige
Finish Coat:	Amercoat 450HS	2 – 3 mils	Per 3.05.A.2
Minimum and Maximum DFT for System		12 – 15 mils	

- d. Tnemec

Coat	Product	DFT (mils)	Color
Prime Coat:	Chembuild Series 135	4 – 6 mils	Aluminum
Stripe Coat:	N69 Hi-Build Epoxoline II		Beige
Intermediate Coat:	N69 Hi-Build Epoxoline II	4 – 6 mils	Beige
Finish Coat:	1074 Endura-Shield II	2 - 5 mils	Per 3.05.A.2
Minimum and Maximum DFT for System		10 – 17 mils	

3.06 FIELD QUALITY CONTROL

A. Testing, General:

1. Test all piping as per SAWS Standard Specification 841, "Hydrostatic Testing Operations".
2. Disinfect all piping as per SAWS Standard Specification 847, "Disinfection".
3. Notification:
 - a. Notify ENGINEER at least 48 hours prior to testing.
 - b. When authorities having jurisdiction are to witness tests, notify ENGINEER and authorities having jurisdiction in writing at least 48 hours in advance of testing.
4. Conduct all tests in presence of OWNER INSPECTOR.
5. Remove or protect pipeline-mounted devices that could be damaged by testing.
6. Provide all apparatus and services required for testing, including:
 - a. Test pumps, compressors, hoses, calibrated gages, meters, test containers, valves, fittings, and temporary pumping systems required to maintain OWNER's operations.
 - b. Temporary bulkheads, bracing, blocking, and thrust restraints.
7. Provide air if an air test is required, power if pumping is required, and gases if gases are required.
8. Unless otherwise specified, OWNER will provide fluid required for hydrostatic testing. CONTRACTOR shall provide means to convey fluid for hydrostatic testing into the pipe being tested. CONTRACTOR shall provide fluid for other types of testing required.
9. Repair observed leaks and repair pipe that fails to meet acceptance criteria. Retest after repair.
10. Unless otherwise specified, testing shall include existing piping systems that connect with new piping system. Test existing pipe to nearest valve. Piping not installed by CONTRACTOR and that fails the test shall be repaired upon authorization of ENGINEER or OWNER. Repair of existing piping will be paid as extra work unless otherwise specified.

B. Examination of Welds:

1. Personnel performing examination of welds shall be qualified to at least Level II, in accordance with ASNT SNT-TC-1A.
2. Conform to ASME Boiler and Pressure Vessel Code Section V and applicable articles for examination of welds.
3. Visually examine all welds, Category D Fluid Service, in conformance with ASME B31.3.
4. Examine at least ten percent of welds using liquid penetrant examination.
5. If a defect is detected, all welds shall be examined by liquid penetrant examination.
6. At conclusion of liquid penetrant examination, remove penetrant test materials by flushing, washing, or wiping clean with applicable solvents.

++ END OF SECTION ++

SECTION 15080
PIPING AND VALVE INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Furnish labor, materials, equipment and incidentals necessary to install removable insulation jackets on piping and valves of all diameters as indicated on the plans and specified herein. Jacket must be designed for dry or wet applications.

1.02 SUBMITTALS

- A. Submittals shall be in accordance with General Conditions and Supplemental Conditions and shall include:
 - 1. Photo documentation of existing piping and valves identifying areas where existing insulation exists, prior to removal for recoating.
 - 2. Schedule of piping and valves to receive insulation.
 - 3. Manufacturer's product datasheets.
 - 4. Operation and Maintenance Manuals

1.03 WARRANTY

- A. Warranty all materials and labor for a period of two years.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with minimum two years documented experience.
- B. Product must be Made in USA.

PART 2 - PRODUCTS

2.01 FOAM INSULATION (For piping smaller than 4" diameter)

- A. Insulation must be heavy duty and UV resistant.
- B. Low density, foam insulation with an ambient temperature range -40-degrees F to 140-degree F per ASTM C1410.
- C. Insulation material must be flexible open-cell melamine.
- D. Polymeric foam must contain no toxic or carcinogenic materials, produces low out gassing and be fire resistant.
- E. Insulation to have self-sealing adhesive strip along the longitudinal seam.
- F. Insulation must have flexible PVC/fabric composite jacket that is permanently laminated to the foam insulation. Jacket must be UV stabilized, flexible PVC reinforced with polyester fibers.

- G. Color is to be selected by the OWNER.
- H. Insulation and jackets must be compatible with heat trace system.
- I. Approved Manufacturers:
 - 1. Techlite Insulation – 379 Series
 - 2. Approved Equal

2.02 PREFORMED THERMAL JACKETS (For piping and valves 4” diameter and larger, including all air release valves)

- A. Approved Manufacturers:
 - 1. ThermaXX LLC 16 Hamilton Street West Haven CT 06516
 - 2. Approved Equal
- B. Insulation
 - 1. For Box Type Jackets:
 - a. High-temperature insulation blanket formed of silica Aerogel and reinforced with a non-woven, glass-fiber batting.
 - b. Insulation must be hydrophobic
 - c. Estimation of Maximum Use Temperature 1200°F (650°C)
 - 2. For Non Box Type Jackets:
 - a. Glass mat, type E needled fiber. ¼”, ½" @ 9 LB/CF & 1" @ 11.3 LB/CF.
 - b. Estimation of Maximum Use Temperature 1200°F (650°C)
 - 3. All insulation materials shall be Non-Asbestos
 - 4. Insulation thickness: As required for Touch Temperature
- C. Jacket:
 - 1. Color to be selected by the OWNER.
 - 2. Hot Side
 - a. PTFE Fiberglass Composite Jacketing, 16.5 oz/sq. yd. minimum
 - b. Estimation of Maximum Use Temperature 550°F (287°C)
 - 3. Cold Side
 - a. PTFE Fiberglass Composite Jacketing, 16.5 oz/sq. yd. minimum
 - b. Estimation of Maximum Use Temperature 550°F (287°C) Thread:
 - 1) Begins to decompose at about 800 degrees (400 degrees C).
 - 2) Does not melt
 - 3) Diameter- .0114
 - 4) Break Point – 35LBS
- D. Insulation and jackets must be compatible with heat trace system.

PART 3 - EXECUTION

3.01 CONSTRUCTION:

- A. Double sewn lock stitch with a minimum 4 to 6 stitches per inch. Jackets shall be sewn with two (2) parallel rows of stitching using thread in section 1.3D. The thread must be able to withstand the skin temperatures without degradation.
- B. Hog rings, staples and wire are not acceptable methods of closure.
- C. No raw cut jacket edges shall be exposed.
- D. Jackets shall be fastened using hook and loop (Velcro) straps and 1” Slide Buckles.

- E. Provide a permanently attached Aluminum or stainless steel nameplate on each jacket to identify its location, size and tag number.
- F. Provide a stainless steel or brass grommet at the low point of each jacket, in wet areas for moisture drain (on horizontal jackets as required).
- G. The insulation shall be designed to minimize the convection current in the space between the hot metal surface and the inner layer of insulation. To this end, during jacket fabrication, the layers of insulating mat shall be placed in an overlapping pattern.
- H. All jacket pieces which match mating seams must include an extended 2" flap constructed from the exterior fabric and shall be secured using hook & loop closure (i.e. Velcro TM) parallel to the seam.
- I. Insulation must be sewn as integral part of the jacket to prevent shifting of the insulation. Insulation pins are not an allowable method of preventing the insulation from shifting and will not be used.
- J. Heat trace loops. Belt loop type loops will be installed on inner (jacket hot side) to allow heat trace to be snaked through. Belt loop locations TBD.

3.02 INSTALLATION

- A. Installation of insulation must be per the manufacturer's written direction.

3.03 COMPONENTS TO BE JACKETED

- A. Contractor must provide and insulate pressure sustaining valve and auxiliary piping, all exposed proposed valves, including ball, gate, butterfly and air release regardless of size and all piping four inch diameter and smaller.

+ + END OF SECTION + +

McMullen Tank Control Valve & Yard Piping Improvements
SAWS Job. No. 18-6005
Solicitation No. CO-00172-SM

INVITATION TO BIDDERS

Solicitation No. CO-00172-SM

Sealed bids are requested by the San Antonio Water System for the construction and installation of a new altitude valve, tank level probes, a ladder for access to the tank, and replacement of yard piping for the **McMullen Tank Control Valve and Yard Piping Improvements Project**, SAWS Job No. **18-6005**.

To view additional project information, as well as obtain the plans and specifications for this project, visit our website located at www.saws.org and click on the Business Center. Then select Bidder, Consultant, and Vendor Registration, which is located on the left-hand side of the screen. Select the Register Now button and proceed with registration.

For difficulties downloading plans and specifications, contact the Contracting Department at 210-233-3341.

A **non-mandatory** pre-bid meeting will be held at **10:00 AM (CT) on March 7, 2019** at the San Antonio Water System's Customer Service Building, 1st floor, Conference Room CR-C137, 2800 U.S. Hwy 281 North, San Antonio, Texas.

For questions regarding this solicitation, technical questions or additional information, please contact Stella Manzello, Contract Administrator, in writing via email to: Stella.Manzello@saws.org or by fax to (210) 233-4290 until **2:00 PM (CT) on March 14, 2019**. Answers to the questions will be posted to the web site by **10:00 AM (CT) on March 18, 2019** as a separate document or included as part of an addendum. Please be advised that Bidders are prohibited from communicating with any other SAWS staff, the Consultant, the Developer, or City of San Antonio officials regarding this IFB up until the contract is awarded as outlined in the Instructions to Bidders.

Sealed bids will be received by Counter Services in the Customer Service office across from the Guard Station, 2800 U.S. Hwy 281 North, Customer Center Building, San Antonio, Texas 78212, **until 2:00 PM (CT), March 29, 2019**. Bids will then be publicly opened and read aloud by Contract Administration in CR-C137, Customer Center Building, 2800 U.S. Hwy 281 North, San Antonio, Texas. Each bid must be accompanied by a cashier's check, certified check, or bid bond in an amount not less than five percent of the total bid price.