

Date: June 28, 2022

Owner: City of Flowery Branch, Georgia

Project: Elevated Water Tank 1 Improvements

Flowery Branch Bid # 22-008

ADDENDUM NUMBER TWO

1. The following Addendum hereby amends and/or modifies the Contract Documents and any previous addenda as indicated and as issued by Infratec Consultants. All Bidders are subject to the provisions of this Addendum. Bidders shall acknowledge receipt of this Addendum on the Bid Form.
2. In Section 13412 Elevated Storage Tank 1; Section 2.1 General; Paragraph C. 3; change the height of the tank from 155' to 152' to match the drawings.
3. Add Section 15100 – Valves and Accessories to the specifications noted with Addendum No. Two in the headers.

End of Addendum Number Two

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**SECTION 15100
VALVES AND ACCESSORIES**

PART 1 GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all tools, equipment, materials, and supplies and shall perform all labor required to furnish and install all valves and appurtenances as indicated on the Drawings, and specified herein.

1.2 RELATED WORK

- A. Instrumentation and Electrical in Divisions 13 and 16.
- B. All valve operators, solenoids, limit switches, etc. located in hazardous areas shall be rated and approved for the area in which it is installed.

1.3 SUBMITTALS

- A. Submit to the ENGINEER, in accordance with Division 1, copies of all materials required to establish compliance with this Section. Submittals shall include at least the following:
 - 1. Certified drawings showing details of construction and dimensions.
 - 2. Descriptive literature bulletins and/or catalogs of each product.
 - 3. The total weight of each item.
 - 4. A complete bill of materials.
 - 5. A valve schedule showing the type and location of all valves.
- B. Certificates
 - 1. For each valve manufactured, tested and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests and certification of proper installation.
- C. Manufacturer's assembly instructions.
- D. Complete operating and maintenance instructions shall be furnished for all equipment specified herein accordance with the General Conditions and Division 1.
- E. In the event that it is impossible to conform to certain details of the specifications due to different manufacturing techniques, describe completely all non-conforming aspects.

1.4 REFERENCE STANDARDS

- A. Design, manufacturing and assembly of elements of the products herein specified shall be in accordance with the standards of the below listed organizations.
- B. American Society for Testing and Materials (ASTM)
- C. American Water Works Association (AWWA)
- D. American National Standards Institute (ANSI)
- E. American Iron and Steel Institute (AISI)

- F. Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS)
- G. National Electrical Manufacturers Association (NEMA)
- H. Underwriters Laboratories (UL)
- I. Factory Mutual (FM)
- J. Where reference is made to a standard of one of the above, or other organizations, the version of the standard in effect at the time of bid opening shall apply.

1.5 QUALITY ASSURANCE

- A. Qualifications
 - 1. All products specified under this Section shall be standard products of proven ability as manufactured by competent organizations that are fully experienced, reputable and qualified in the manufacture of the products to be furnished. The products shall be designed, constructed and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed.
 - 2. All products furnished under this Section shall be new and unused and shall be the standard products of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of five (5) years.
 - 3. These Specifications are intended to give a general description of what is required, but do not cover all details which may vary in accordance with the exact requirements of the products as offered. They are, however, intended to cover the furnishing, delivery, installation, field testing and field calibration of all materials and apparatus as required. Any additional equipment necessary for the proper operation of the proposed installation not specifically mentioned in these Specifications or shown on the Drawings shall be furnished and installed at no change in Contract Price or Time.
 - 4. All products of the same type shall be the product of one manufacturer.
- B. Inspection of products may also be made by the Construction Manager after delivery. Products shall be subject to rejection at any time due to failure to meet any of the Specification requirements, even though submittal data may have been accepted previously. Products rejected after delivery shall be marked for identification and shall be removed from the job site at once.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Reference is made to Section 01600 for additional information.
- B. Packing and Shipping
 - 1. Care shall be taken in loading, transporting and unloading to prevent injury to the valves, appurtenances, or coatings. Equipment shall not be dropped. All valves and appurtenances shall be examined before installation and no piece shall be installed which is found to be defective. Any damage to the coatings shall be repaired as acceptable to the Engineer.
 - 2. Prior to shipping, the ends of all valves shall be acceptably covered to prevent entry of foreign material. Covers shall remain in place until after installation and connecting piping is completed.
 - 3. All valves 3-in and larger shall be shipped and stored on site until time of use with wood or plywood covers on each valve end.

4. Valves smaller than 3-in shall be shipped and stored as above except that heavy cardboard covers may be used on the openings.
 5. Rising stems and exposed stem valves shall be coated with a protective oil film that shall be maintained until the valve is installed and put into use.
 6. Any corrosion in evidence at the time of acceptance by the Owner shall be removed, or the valve shall be removed and replaced.
- C. Storage and Protection
1. Special care shall be taken to prevent plastic and similar brittle items from being directly exposed to the sun, or exposed to extremes in temperature, to prevent deformation. See the individual piping specifications and manufacturer's information for further requirements.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT - GENERAL

- A. The use of a manufacturer's name and/or model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- B. Valves and appurtenances shall be of the size shown on the Drawings or as noted and as far as possible equipment of the same type shall be identical and from one manufacturer.
- C. Valves and appurtenances shall have the name of the maker, nominal size, flow directional arrows, working pressure for which they are designed and standard referenced, cast in raised letters or indelibly marked upon some appropriate part of the body. The name of the valve manufacturer, rated working pressure, and size may be stamped on a stainless steel identification plate permanently attached to the valve body or bonnet. Valves specified to conform with AWWA requirements shall have the letter "AWWA" cast upon the valve body or bonnet in raised letters.
- D. Unless otherwise noted, items shall have a minimum working pressure of 150 psi or be of the same working pressure as the pipe they connect to, whichever is higher and suitable for the pressures noted where they are installed.
- E. Buried valves shall be set vertically and in a closed position . An approved valve box constructed of cast iron with a round base shall be provided on each valve. The valve box shall be of the sliding type with a 5 inch shaft and cover shall be slotted for easy removal. The box shall be set vertical and centered over the valve operating nut with the top adjusted to the finish grade. A 2'x2'x4" concrete pad shall be poured around each valve box.
- F. Where required for satisfactory operation of valves, provide extension stems within 24" of the finished grade for buried valves, stainless steel extension stems for exposed valves, cast iron stem guides, floor boxes, handwheels, floor stands, and other appurtenances.

2.2 VALVE ACTUATORS - GENERAL

- A. The valve manufacturer shall supply and integrally, rigidly mount all actuators, including any type of manual or powered actuators, on valves at the factory. The valves and their individual actuators shall be shipped as a unit.

- B. Unless otherwise noted, valves shall be manually actuated; non-buried valves shall have an operating wheel, handle or lever mounted on the operator; buried valves and those with operating nuts shall have a non-rising stem with an AWWA 2-in nut.
- C. Except as otherwise shown on the Drawings or specified herein, all valves 3-in diameter or larger, with the valve center line located 7-ft or more above the operating floor, shall be provided with chain wheel operators complete with chain guides and hot dipped galvanized steel chain, which loop within 4-ft of the operating floor.
- D. Each operating device shall have cast on it the word "OPEN" and an arrow indicating the direction of operation.
- E. Floor boxes for operating nuts recessed in concrete shall be standard cast iron type, cast-in-place, with fastening top by Clow or equal.
- F. Stem guides shall be of the adjustable wall bracket type, bronze bushed, with maximum spacing of 10-ft as manufactured by Clow; Rodney Hunt or equal. Extended operating nuts and/or stems shall have universal joints and pin couplings, if longer than 10-ft and a rating of at least five times the maximum operating torque. Stem adapters shall be provided.
- G. Where required by the installation, or as specified, provide the following: extended stem; floor stand and handwheel; position indicator and etched or cast arrow to show direction of rotation to open the valve; resilient, moisture-resistant seal around stem penetration of slab.
- H. Gear Actuators
 - 1. Unless otherwise noted, gear actuators shall be provided for the following: all valves of larger than 3-in nominal diameter; all buried valves with operating shaft mounted horizontally (butterfly, plug, etc); where specified and/or indicated on the Drawings; where manual operator effort is greater than 80 ft-lbs. rim pull.
 - 2. Gear actuators shall be of the worm or helical gear type with output shaft perpendicular to valve shaft, having a removable hand wheel mounted on the output shaft. Unless noted they shall conform to AWWA C504, but except with butterfly valves, need not be certified.
 - 3. Actuators shall be capable of being removed from the valve without dismantling the valve or removing the valve from the line.
 - 4. Gearing shall be machine-cut steel designed for smooth operation. Bearings shall be permanently lubricated, with bronze bearing bushings provided to take all thrusts and seals and to contain lubricants. Housings shall be sealed to exclude moisture and dirt, allow the reduction mechanisms to operate in lubricant and be of the same material as the valve body.
 - 5. Manual operator input effort to the handwheel shall be a maximum of 40 ft-lbs. for operating the valve from full open to full close, under any conditions. Gear actuators shall indicate valve position and have adjustable stops. Maximum handwheel size shall be 24-in diameter.

2.3 GATE VALVES (2-1/2-IN. AND SMALLER)

- A. Gate valves 2-1/2-in diameter and smaller shall have flanged, screwed, or solder ends as required and shall be brass, or bronze, or Type 304 stainless steel solid wedge, union bonnet, rising-stem gate valves such as Figures 47 and 48 as manufactured by Jenkins Brothers, or equal products as manufactured by Kennedy Valve Manufacturing Co.; Crane; or equal.

- B. All water valves 2-1/2-in and 3-in unless noted otherwise, shall be brass body gates and shall be Jenkins No. 1240, equal by Crane, Kennedy, or equal.

2.4 GATE VALVES (3-IN. AND LARGER)

A. General Requirements

1. Unless otherwise specified below, these requirements shall apply to all gate valves.
2. Gate valves shall meet the requirements of AWWA C500 and AWWA C509 as applicable to the type of valve specified.
3. Buried and submerged valves shall be furnished with mechanical joints and stainless steel hardware; non-rising stem design.
4. Exposed valves shall be furnished with Class 125 flanged ends; provide valves with outside screw and yoke.
5. All-metal valves shall be manufactured of ASTM A126 Cast Iron, Class B, with bronze mounting design.
6. Rising stem valves shall be sealed with adjustable and replaceable packing; valve design must permit packing replacement under operating system pressures with only moderate leakage.
7. Non-rising stem valves shall use a double O-ring stem seal, except that packing shall be used where geared operators are required.
8. Except as otherwise specified, valves shall be rated for the following working water pressures:
 - a. 3-in to 12-in: 250 psig
 - b. 14-in to 20-in: 150 psig
 - c. 24-in and greater: 50 psig
9. All valve bodies shall be hydrostatically tested to at least twice the rated working water pressure. In addition, valves shall be seat-tested, bi-directional at the rated working pressure, with seat leakage not to exceed one fluid ounce per inch of valve diameter per hour. Provide certificates of testing.
10. Flanged valves to have face-to-face dimensions per ANSI B16.1 and flanges per ANA1 B16.10.
11. Exposed valves 16-in. and larger to have valve by-pass.
12. All bonnet and packing gland bolts shall be zinc or cadmium electroplated steel; packing gland bolts shall have bronze nuts.
13. Exposed valves, 16-inches in diameter and larger, indicated for horizontal stem installation shall be furnished with rollers, tracks and scrapers and enclosed bevel gear grease case.
14. All valves shall be marked per AWWA Standards, including name of manufacturer, valve size and working pressure and year of manufacture.
15. Unless otherwise indicated, valves 12-in and smaller shall be capable of installation in the vertical or horizontal position, and sealing in both directions at the rated pressure.

16. Valve operation shall be counterclockwise for potable water; clockwise for wastewater and other non-potable waters. Provide permanent label showing "OPEN" and arrows.
17. Metal-seated valves shall be coated internally and externally with an asphaltic varnish, per AWWA C500. Resilient seated valves shall be coated, interior and exterior, with fusion bonded epoxy per AWWA C550.

B. Valve Applications

1. Valves for Potable Water Service.
 - a. Resilient seated wedge design equal to M&H Valve Company Model 4067-01 or Mueller A-2360-20.

C. Valve Requirements

1. Resilient Seated
 - a. Conform to AWWA C509. Also UL and FM approved.
 - b. Internal and external epoxy coating of valve body, including bonnet, per AWWA C550.
 - c. Gate shall be encapsulated synthetic rubber. It shall be bonded and vulcanized in accordance with ASTM B429 Method B.
 - d. No recesses in valve body.

D. Buried Valves

1. Conform to the requirements above, except mechanical joint bell ends per AWWA C111.
 - a. All exposed valve hardware (nuts, bolts, washers, etc) including bonnet, bonnet cover, stuffing box, gear adapter and joints shall be Type 304 stainless steel.
2. Non-rising stem design, double O-ring seals for non-g geared valves and shall incorporate packing for geared valves.
3. Provide valve box, 2-in operating nut and extension stem and stem cover.

2..9 SURFACE PREPARATION AND SHOP COATINGS

- A. Notwithstanding any of these Specifications, all coatings and lubricants in contact with potable water shall be certified as acceptable for use with that fluid.
- B. Unless otherwise specified herein, coatings shall comply with the requirements of Division 9. In case of a conflict, the requirements of this Section govern.
- C. If the manufacturer's requirement is not to require finished coating on any interior surfaces, then manufacturer shall so state and no interior finish coating will be required, if acceptable to the Engineer.
- D. The exterior surface of various parts of valves, operators, floor stands and miscellaneous piping shall be thoroughly cleaned of all scale, dirt, grease or other foreign matter and thereafter one shop coat of an approved rust-inhibitive primer such as Tnemec Epoxy Primer 66-BJ45 shall be applied in accordance with the instructions of the paint manufacturer or other primer compatible with the finish coat provided.
- E. Unless otherwise noted, interior ferrous surfaces of all valves shall be given a shop finish of an asphalt varnish conforming to AWWA C509, (except mounting faces/surfaces) or epoxy AWWA C550 with a minimum thickness of 4 mil.

- F. Ferrous surfaces obviously not to be painted shall be given a shop coat of grease or other suitable rust-resistant coating. Mounting surfaces shall be especially coated with a rust preventative.
- G. Special care shall be taken to protect uncoated items and plastic items, especially from environmental damage.

2.10 FACTORY INSPECTION, TESTING AND CORRECTION OF DEFICIENCIES

- A. Factory inspection, testing and correction of deficiencies shall be done in accordance with the referenced Standards and as noted herein.
- B. See Division 1 for additional requirements. Also refer to PART 1 of this Section, especially for required submission of test data to the Engineer.
- C. In addition to all tests required by the referenced Standards, the following shall also be factory tested:
 - 1. Pressure regulating valves shall be factory tested at the specified pressures and flows.
 - 2. All types of air and vacuum valves.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. All valves and appurtenances shall be installed per the manufacturer's instructions in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Construction Manager before they are installed.
- B. Install all brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings, or otherwise required. Before setting these items, check all Drawings and figures that have a direct bearing on their location. The Contractor shall be responsible for the proper location of valves and appurtenances during the construction of the Work.
- C. All materials shall be carefully inspected for defects in construction and materials. All debris and foreign material shall be cleaned out of openings, etc. All valve flange covers shall remain in place until connected piping is in place. All operating mechanisms shall be operated to check their proper functioning and all nuts and bolts checked for tightness. Valves and other equipment that do not operate easily, or are otherwise defective, shall be repaired or replaced at no additional cost to the Owner.
- D. Where installation is covered by a Referenced Standard, installation shall be in accordance with that Standard, except as herein modified, and the Contractor shall certify such. Also note additional requirements in other parts of this Specification.
- E. Unless otherwise noted, joints for valves and appurtenances shall be made up utilizing the same procedures as specified under the applicable type connecting pipe joint and all valves and other items shall be installed in the proper position as recommended by the manufacturer. Contractor shall be responsible for verifying manufacturers' torquing requirements for all valves.

3.02 INSTALLATION OF MANUAL OPERATIONAL DEVICES

- A. Unless otherwise noted, all operational devices shall be installed with the units of the factory, as shown on the Drawings or as acceptable to the Construction Manager to allow accessibility to operate and maintain the item and to prevent interference with other piping, valves and appurtenances.
- B. For manually operated valves 3-in in diameter and smaller, valve operators and indicators shall be rotated to display toward normal operation locations.
- C. Floor boxes, valve boxes, extension stems and low floor stands shall be installed vertically centered over the operating nut, with couplings as required and the elevation of the box top shall be adjusted to conform with the elevation of the finished floor surface or grade at the completion of the Contract. Boxes and stem guides shall be adequately supported during concrete pouring to maintain vertical alignment.

3.03 INSPECTION, TESTING AND CORRECTION OF DEFICIENCIES

- A. Do not over pressurize valves or appurtenances during pipe testing. If any unit proves to be defective, it shall be replaced or repaired to the satisfaction of the Construction Manager.
- B. Testing shall not be performed until the manufacturer's service engineer has provided written certification that the installed equipment has been examined and found to be in complete accordance with the manufacturer's requirements.
- C. Functional Test: Prior to plant startup, all items shall be inspected for proper alignment, quiet operation, proper connection and satisfactory performance. All units shall be operated continuously while connected to the attached piping for at least 48 hours, without vibration, jamming, leakage, or overheating and perform the specified function.
- D. The various pipe lines in which the valves and appurtenances are to be installed are specified to be field tested. During these tests any defective valve or appurtenance shall be adjusted, removed and replaced, or otherwise made acceptable to the Construction Manager.
- E. Various regulating valves, strainers, or other appurtenances shall be tested to demonstrate their conformance with the specified operational capabilities and any deficiencies shall be corrected or the device replaced or otherwise made acceptable to the Construction Manager.

3.04 CLEANING

- A. All items (including valve interiors) shall be cleaned prior to installation, testing, disinfection, and final acceptance.

3.05 DISINFECTION

- A. Disinfection of valves and appurtenances on all potable water lines and where otherwise noted, shall be as noted in the Section 15060-Ductile Iron Pipe and Fittings.

END OF SECTION 15100