



ADDENDUM NO. 2

DATE: September 11, 2020

PROJECT: Lake Ouachita Water Supply Project
Contract A – Finished Water Transmission Pipeline
Hot Springs, Arkansas

BID DATE: September 15th, 2020 at 2:00 PM

This Addendum forms a part of the Contract Documents and modifies the original documents provided to Bidders, as noted below. Acknowledge receipt of this Addendum in the space provided in the BID FORM. Failure to do so may subject the Bidder to disqualification.

Item No. 1. Specifications – Section 331100 – Water Pipe and Fittings

- a. Replace paragraph 1.4.D. in its entirety with the following:

1.4.D. All Ductile Iron Pipe shall be domestic made. Non-domestic fittings will be accepted.

END OF ITEMS

All other provisions of the Contract Documents remain unchanged. Acknowledge receipt of this addendum on the Bid Form. Bids must be received at Hot Springs Finance Department, 324 Malvern Avenue, Hot Springs, Arkansas 71901 up until 1:00 PM on September 15th, 2020. After 1:00 PM they should be delivered to Hot Springs City Hall, 133 Convention Blvd, Hot Springs, 71901 by 2:00 PM on September 15th, 2020.

A handwritten signature in black ink that reads "Kelly D. Vanlandingham". The signature is written in a cursive style with a large, stylized "R" at the end.

9/11/20

Kelly D. Vanlandingham, PE (Crist Engineers, Inc.)

Date

SECTION 331100

WATER PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This specification includes Ductile iron and PVC water pipeline, valves, valve boxes, blocking, fittings, and other appurtenances, outside building limits.

1.2 REFERENCES

- A. City of Hot Springs Engineering Standard Specifications and standard terms and conditions for Water and Wastewater Projects.
1. All products and executed work must meet or exceed the City of Hot Springs Standard Specifications, except as modified or augmented herein.
- B. Ductile Iron Pipe Research Association (DIPRA), Birmingham, AL
1. Handbook of Ductile Iron Pipe, Sixth Edition
- C. American Society for Testing and Materials (ASTM), Philadelphia, PA
1. ASTM A53 - Pipe, Steel, Black and Hot Dipped, Zinc-Coated Welded and Seamless.
 2. ASTM A126 - Gray Iron Castings for Valves, Flanges and Pipe Fittings.
 3. ASTM A307 - Carbon Steel Bolts and Studs 60,000 psi Tensile.
 4. ASTM A536 - Ductile Iron Castings.
 5. ASTM D1784 - Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
 6. ASTM D1785 - PVC Plastic Pipe, Schedules 40, 80, and 120.153
 7. ASTM D2241 - PVC Plastic Pipe (SDR-PR).
 8. ASTM D2466 - PVC Plastic Pipe Fittings, Schedule 40.
 9. ASTM D2564 - Solvent Cement for PVC Plastic Pipe and Fittings.
 10. ASTM D2737 - Polyethylene (PE) Plastic Tubing.
 11. ASTM D2855 - Making Solvent-Cemented Joints with PVC Pipe and Fittings.
 12. ASTM D3139 - Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 13. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- D. American Water Works Association (AWWA)
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
 2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems
 3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-in through 48-in for Water and Other Liquids
 4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
 5. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges
 6. AWWA C150 - Thickness Design of Ductile-Iron Pipe
 7. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds
 8. AWWA C153 - Ductile-Iron Compact Fittings, 3-in through 24-in and 54-in through 64-in for Water Service
 9. AWWA C500 - Gate Valves for Water and Sewerage Systems
 10. AWWA C502 - Dry Barrel Fire Hydrants

11. AWWA C509 - Resilient-Seated Gate Valves
12. AWWA C510 - Standard for Double Check Valve Backflow-Prevention Assembly
13. AWWA C511 - Standard for Pressure-Reducing Principle Backflow-Prevention Assembly
14. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances
15. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
16. AWWA C651 - Standard for Disinfecting Water Mains
17. AWWA C900 - Standard for PVC Pressure Pipe, 4 Inch through 12 Inch
18. AWWA C905 - Standard for PVC Water Transmission Pipe, Nominal Diameters 14 Inch through 36 Inch.

E. American Welding Society

1. AWS D11.2 Guide for Welding Iron Casting

F. Manufacturers Standardization Society (MSS)

1. MSS SP-60- Connecting Flange Joint between Tapping Sleeves and Tapping Valves
2. MSS SP-111- Gray Iron and Ductile Iron Tapping Sleeves

1.3 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop Drawings: The Contractor shall submit catalog cuts of pipe and fittings in accordance with the requirements of this Section.

1. Certified dimensional drawings of all valves, fittings, and appurtenances.
2. Certified dimensional drawings of joints, showing the manufacturer=s allowable deflections.
3. Copies of the manufacturer=s approved installation instructions for the types of joints being used.

C. Certificate of Compliance: Submit Certificates of Compliance attesting that materials provided are in compliance with referenced standards.

D. Contract Closeout Submittals: Submit documents in accordance with Section 01700. Accurately record installed location of valves, piping, and accessories.

1.4 QUALITY ASSURANCE

A. Water line installation shall be in accordance with manufacturer's recommendations and as supplemented by these Specifications.

B. Pipe shall be kept clean of all foreign matter.

1. At temporary termination of pipe laying, provide suitable cover to close open end until burying operations are resumed.

C. Jointing shall be by trained employees.

D. All Ductile Iron Pipe shall be domestic made. Non-domestic fittings will be accepted.

PART 2 - PRODUCTS

2.1 STEEL PIPE

- A. Steel pipe for water transmission pipeline must comply with requirements in Section 331102.

2.2 DUCTILE IRON PIPE

- A. General: Ductile iron pipe (DIP) shall conform to AWWA C151, subject to the following supplemental requirements. The pipe shall be of the diameter and class shown, shall be furnished complete with rubber gaskets as indicated in the Contract Documents, and all specials and fittings shall be provided as required under the Contract Documents.
- B. All Ductile Iron Pipe shall be manufactured in an ISO 9001 Certified Plant. Contractor shall provide documentation from the Pipe and Fitting Manufacturer of ISO 9001 Certification prior to ordering Ductile Iron Pipe and Fittings.
- C. Laying Lengths: Pipe laying lengths shall be provided in 18 or 20-foot nominal lengths with allowable trim pipe lengths in accordance with AWWA C151 and special shorter lengths provided as required by the Drawings.
- D. Design Parameters: All ductile iron pipe shall be designed and manufactured in accordance with AWWA C150 and AWWA C151, respectively, for the following minimum operating conditions:
 - 1. The minimum internal design pressure shall be 150 psi with a 100-psi surge allowance, with a safety factor of 2, for a total internal design pressure of 500 psi. No reduction of safety factor for transient pressures shall be allowed.
 - 2. The external loads design criteria shall be a minimum of 4-foot depth of cover at 120 pounds per cubic feet soil weight and live load based on one AASHTO H-20 truck load. The thickness design of ductile iron pipe shall be in accordance with AWWA C150.
 - 3. The horizontal deflection of cement-mortar lined ductile iron pipe resulting from external load conditions shall not exceed 3 percent of the pipe diameter.
 - 4. The pipe trench, per AWWA C150, for design purposes only shall be:
 - a. Laying Condition Type 2- Flat Bottom Trench with Backfill Lightly consolidated (roughly 70 to 80% of standard proctor density) to centerline of pipe. As a minimum. For pipe installed in rock trenches the Laying Condition increases to Type 3 which is pipe bedded in 4 inches of loose soil (or trench bottom raked with bucket teeth to the equivalent depth) and backfill lightly consolidated to the top of the pipe. Actual pipe laying conditions are shown in the details of the plans.
- E. Polyethylene Encasement: All ductile iron pipe shall be installed with polyethylene encasement in accordance with AWWA C105.
- F. Pipe Class: All pipe shall have a minimum pressure rating as indicated below, or higher ratings as indicated on the drawings.

<u>Pipe Sizes (inch)</u>	<u>Pressure Class (psi)</u>
4-12	350
14-20	250
24-64	200

G. Joint Design: Ductile iron pipe and fittings shall be furnished with push-on joints (non-restrained or restrained), mechanical joints (MJ), or flanged joints as detailed on the Drawings.

1. Push-on Joints: Any ductile iron pipe joint not specifically noted on the Drawings to be otherwise shall be considered to be push-on joint. Unless otherwise specified, gasket material shall be standard styrene butadiene copolymer (SBR). Non-restrained push-on joints shall be Fastite, as manufactured by American Ductile Iron Pipe, or approved equal. The pressure rating for push-on joints shall be a minimum of 350 psi or the specified pressure rating of the pipe, whichever is less.
2. Mechanical Joints: Mechanical joints shall conform to AWWA C111. Bolts shall be high-strength, low-alloy steel per AWWA C111. Unless otherwise specified, gasket material shall be standard styrene butadiene copolymer (SBR) per this standard.
3. Welded-on Thrust Collars: Welded-on thrust collars, for wall pipe and pipe thrust restraint, shall be welded steel collars designed for the thrust generated by 250 psi working pressure with a safety factor of at least two (2.0) against failure. Welded-on thrust collars shall be as manufactured by American Ductile Iron Pipe or pre-approved equal. The manufacturer shall qualify all welding procedures and welders per the requirements of a documented quality assurance system based on ANSI/AWS D11.2.
4. Restrained push-on joint pipe shall meet the requirements in section 2.5.

H. Cement Mortar Lining

1. General: Ductile iron pipe shall be internally lined with cement-mortar lining in accordance with AWWA C104, by a high speed, centrifugal process. The quality system of the manufacturer shall be registered to an ISO 9000 quality standard by an accredited registrar. Grinding of linings shall not be allowed. The finished cement lining shall be uniformly smooth. In addition to complying with AWWA C104, the linings shall also comply with the following additional requirements:
2. Material: The cement used shall be a Portland Cement. Sand shall consist of inert, hard, strong, and durable silica grains. The water used in the cement mortar shall be potable, and free from injurious quantities of organic matter, alkali, salt or other impurities that might reduce the strength, durability, or other desirable qualities of the lining. All material in contact with water shall be certified to meet the requirements of ANSI/NSF Standard 61. The cement mortar shall contain not less than one part of cement to two parts of sand by volume.
3. Lining Thickness: Cement lining thicknesses shall be per AWWA C104 either single or double thickness and as shown in Table below:

<u>Nominal Pipe Diameter</u>	<u>Minimum Lining Thickness</u>
3-12"	1/16"
14-24"	3/32"
30-64"	1/8"

4. Surface Preparation: All surfaces to be mortar lined shall be cleaned as necessary to remove foreign matter that could interfere with the adherence of the cement mortar or protrude through the lining.
5. Repairs: All repairs of handling or other damage shall be made in accordance with the recommendations of the manufacturer and shall be reasonably smooth and may not project into the waterway.

I. Exterior Coating:

1. All ductile iron shall have an external 200 g/m² (0.65 oz/ft²) or arc sprayed zinc base coat per ISO 8179 and shall have a manufacture mark indicating zinc application. All buried and below-floor DIP shall be furnished and installed with standard asphaltic top coating one mil thick in accordance with AWWAC151, AWWA C110 and AWWA C153.
2. All ductile iron pipe that will not be buried or encased in concrete shall have a shop applied primer. Primer shall be a bluish-grey color, single component moisture-cured urethane containing among other ingredients, micaceous iron oxide (MIO) pigments and zinc. Primer shall be specifically formulated and evaluated for use on ductile iron pipe and fittings, suitable for immersed and non-immersed applications. The primer must be compatible with metallic zinc coating, acrylic, coal tar, catalyzed epoxy, polyurethane, moisture-cure urethane and asphalt-based topcoats. The shop applied primer shall be MC-FerroCladJ Primer, manufactured by Wasser High Tech Coatings, Tnemec Series 1 Omnithane, or approved equal.
 - a. Surface Preparation & Application: Follow carefully manufacturer=s published surface preparation requirements for ductile iron pipe. Primer shall be applied per manufacturer=s recommendations to achieve a minimum dry film thickness of 3.5 mils as measured per Steel Structures Painting Council SSPC-PA2, Paint Application Specification No. 2, Measurement of Dry Paint Thickness with Magnetic Gages.

2.3 DUCTILE IRON FITTINGS

- A. General: Fittings shall be ductile iron in accordance with City of Hot Springs Standard Specifications.
- B. All Ductile Iron Fittings shall be manufactured in an ISO 9001 Certified Plant. Contractor shall provide documentation from the Pipe and Fitting Manufacturer of ISO 9001 Certification prior to ordering Ductile Iron Pipe and Fittings.
- C. Fittings shall have distinctly cast on them the manufacturer's identification, pressure rating, nominal diameter of openings, and the number of degrees or fraction of the circle on bends.
- D. Flanged Fittings: Flange fittings shall be ductile iron in accordance with AWWA C110 or AWWA C153, not ANSI B16.1. Bolt circle and bolt holes match those of ANSI B16.1 class 125 and ANSI B16.5 class 150 flanges. The flanges shall be rated for at least 250 psi working pressure. Bolts, gaskets and installation shall be in accordance with AWWA C110 or AWWA C115, Appendix A. Flanged gaskets for all water applications shall be NSF 61 certified 1/8" thick Toruseal gaskets as manufactured by American Ductile Iron Pipe. Gaskets shall be full face NSF 61 certified Toruseal design. Gaskets for flanged ductile iron pipe fittings must not have the larger inside diameters provided by the requirements of ANSI B16.21. Flange facing shall be smooth or with shallow serrations per AWWA C110 or AWWA C153, no raised face flanges.
- E. Fittings 2 Inches and Larger: Where taps are shown on fittings, tapping bosses shall be provided.
 1. Flanged Joint: ANSI/AWWA C153 and ANSI B16.1, faced and drilled 125-pound ANSI standard.
 2. Mechanical Joint Megalugs: AWWA C153 (ANSI A21.53) and AWWA C110 (ANSI A21.10).
 3. Push-on Joint: American Fastite, or US Pipe Tyton ANSI/AWWA C153 or equal. Restrained push-on joint pipe shall meet the requirements in section 2.5.
- F. Exterior Coating:

1. All buried and below-floor DIP shall be furnished and installed with standard asphaltic top coating one mil thick in accordance with AWWAC151, AWWA C110 and AWWA C153.
2. All ductile iron pipe fittings that will not be buried or encased in concrete shall have a shop applied primer. Primer shall be a bluish-grey color, single component moisture-cured urethane containing among other ingredients, micaceous iron oxide (MIO) pigments and zinc. Primer shall be specifically formulated and evaluated for use on ductile iron pipe and fittings, suitable for immersed and non-immersed applications. The primer must be compatible with metallic zinc coatings, acrylic, coal tar, catalyzed epoxy, polyurethane, moisture-cure urethane and asphalt-based topcoats. The shop applied primer shall be MC-FerroClad Primer, manufactured by Wasser High Tech Coatings or approved equal.
 - a. Surface Preparation & Application: Follow carefully manufacturer's published surface preparation requirements for ductile iron pipe. Primer shall be applied per manufacturer's recommendations to achieve a minimum dry film thickness of 3.5 mils as measured per Steel Structures Painting Council SSPC-PA2, Paint Application Specification No. 2, Measurement of Dry Paint Thickness with Magnetic Gages.

2.4 RESTRAINING JOINT PIPE / FITTINGS

- A. Use EBAA 1100 MEGALUG or approved equal for all mechanically restrained DIP fittings. Restraint harnesses EBAA MEGALUG 1700 Series or approved equal for DIP waterlines rated for a minimum of 250 PSI to restrain the identified bell/spigot pipe lengths. Split bell restraint harness with a rating less than 250 PSI shall not be allowed. All mechanical restrained DIP fittings shall include the EBAA Seal Improvement Mechanical Joint Gasket or approved equal. All mechanical restraints and harnesses shall be coated with a factory applied fusion bonded epoxy coating to no less than 3 mils in thickness. All bolts, washes, rods or any other incidental hardware shall be coated with a factory applied two (2) coat fluoropolymer coating to no less than 0.7 mils in thickness.
- B. Restrained joint with a precast or cast in place thrust block may be used, where appropriate, if pre-approved in writing by the engineer, in lieu of restraint harnesses. Use EBAA MEGALUG 1100 series or approved equal where all thrust blocks are approved for use. The Contractor must submit detailed thrust block calculations, dimensions and reinforcement with a site-specific geotechnical investigation demonstrating the minimum allowable bearing pressure. All thrust restraint calculations shall have a minimum safety factor of 2 to 1. All thrust blocks shall use rebar (mesh is not allowed) with a minimum of 3000 PSI concrete meeting all ACI codes for design and placement of reinforced concrete. All calculations shall be sealed by a licensed State of Arkansas Professional Engineer.
- C. Where restraining of mechanical joint fittings and/ or restraint harnesses is required or identified on the plans, the Contractor may use propriety restrained joint pipe/ fittings (equivalent restrained length) that is American Cast Iron Pipe Company FLEX-RING by American Cast Iron Pipe Company of Birmingham, AL or TR FLEX by U.S. Pipe of Birmingham, AL or TR Flex by McWane Ductile of Birmingham, AL. Written pre-approval from the engineer is required for all use of all other propriety restrained joint pipe/ fittings. Pre-approval must be obtained at least 15 days prior to the open of the bid. All propriety restrained joint pipe shall be ductile iron pipe and conform to the requirements described in Section 2.2.

2.5 LOCATING TAPE

- A. Terra Tape "Extra Stretch", or equal.

- B. Blue in color and including the words AWater Line Below@ in black print.

2.6 TEMPORARY PIPE PLUGS

- A. Non-pressure polyethylene plugs with handles sized to fit bells or spigots or sizes 6" to 60" shall be Taylor Made Plastics or equal.

2.7 CONCRETE FOR THRUST BLOCKS AND ANCHOR COLLARS

- A. Concrete for thrust blocks and anchor collars shall conform to City of Hot Springs Standard Specifications Section 19, Article II.

PART 3 - EXECUTION

3.1 PIPE INSTALLATION

- A. Pipe Installation shall conform to the City of Hot Springs Standard Specifications, except as modified or augmented herein.

3.2 LOCATING TAPE

- A. Shall be used on ALL pipe including ductile iron.
- B. Install 12 to 18 inches above the pipe as shown on Drawings.
- C. The tape shall be in addition to trace wire specified later for PVC pipe.

3.3 TESTING

- A. Pressure lines shall be hydrostatically tested at the pressures listed in Section 331400.
- B. Engineer and Owner shall observe and document tests.
- C. Use pipe-locating equipment to test continuity of trace wire.

3.4 FIELD REPAIRS

- A. In the event that testing reveals a leak either at the joint or anywhere in between field repairs shall utilize mechanical joint solid sleeves similar or equal to American Table 5-18 or 5-19 conforming to AWWA C153 and C110 respectively. Leaks originating with improperly installed or defective gaskets shall not be repaired with bell joint leaks clamps or other similar device. Leaks originating from a perforation in the pipe wall shall not be repaired with full circle clamps or similar. Instead the source of the leak shall be cut out and suitable length of new pipe inserted in place of the cut out section and then coupled together with the solid sleeves.

3.5 INSPECTION

- A. Construction of the water line will be inspected by the Engineer and the Owner. Do not cover any work without approval of Inspector. Work covered prior to inspection will be uncovered and reworked as required at Contractor=s expense.

END OF SECTION