

ADDENDUM No. 2

To

Contract Documents, Specifications, and Plans

For

**AMERICAN FORK CITY
CANYON WATER LINE PROJECT**

November 29, 2018



ADDENDUM No. 2
To
Contract Documents, Specifications, and Plans
For
American Fork City
American Fork Canyon Water Line Project
November 29, 2018

These Contract Documents, Specifications, and Plans are hereby revised to include the following changes. Contractors bidding the project shall conform to these revisions and acknowledge receipt of this Addendum on Page 1 of the Bid Form (003000-1).

SPECIFICATIONS

Add: Attached section 331113 Ductile Iron Piping. Intent is to cover ductile iron fittings and bolts.

REPLACE:

Addendum #2 is hereby approved and issued on November 29, 2018.

By Horrocks Engineers

John E. Schiess, P.E.

END ADDENDUM

SECTION 331113
DUCTILE IRON PIPING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Ductile iron piping, joints, fitting, cleanouts, and pipe lining and coating.
- B. Related Sections:
 - 1. Section 331112- Basic Piping Materials and Methods.

1.02 REFERENCES

- A. American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME):
 - 1. B 16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
- B. American Society for Testing and Materials (ASTM):
 - 1. A 47 - Ferritic Malleable Iron Casting.
 - 2. A 536 - Ductile Iron Castings.
- C. American Water Works Association (AWWA):
 - 1. C 104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. C 110 - Ductile-Iron and Gray-Iron Fittings, 3 Inches Through 48 Inches, for Water and Other Liquids.
 - 3. C 111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 4. C 150 - Thickness Design of Ductile-Iron Pipe.
 - 5. C 151 - Ductile-Iron Pipe, Centrifugally Cast for Water or other Liquids.
 - 6. C 153 - Ductile-Iron Compact Fittings, 3 Inches Through 24 Inches, and 54 Inches Through 64 Inches, for Water Service.
 - 7. C 600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
 - 8. C 606 - Joints Grooved and Shouldered Type.

1.03 SUBMITTALS

- A. Product Data: Prior to construction submit photographs, drawings, and descriptions of fittings, gaskets, couplings, grooving of pipe and fittings, and pipe lining.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Block piping material for shipment, prevent damage to castings and linings.
- B. Carefully handle piping material during loading, unloading, and installation. Do not drop piping material from cars or trucks. Lower piping material by mechanical means. Do not drop or pound pipe to fit grade.
- C. Repair damaged pipe lining to match quality, thickness, and bonding of original lining. When lining cannot be repaired or repairs are defective, replace defective piping with undamaged piping.

1.05 SUBMITTALS AT PROJECT CLOSEOUT

- A. Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
- B. Thrust Restraint Systems: Layouts and supporting calculations for restrained joint thrust restraint systems.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Ductile Iron Piping:
 - 1. Type, Typical: AWWA C 150 and AWWA C 151 latest revision with minimum Pressure Class 350 wall thickness.
 - 2. Type with Screw-On Flanges: AWWA C 115 with minimum Class 53 wall thickness.
- B. Joints:
 - 1. Flanged Joints:
 - a. Flanges: One of the following with diameter, thickness, drilling, and other characteristics in accordance with ANSI B 16.1:
 - 1) Cast integrally with the pipe.
 - 2) Screw-on: Comply with the following:
 - a) Ductile iron
 - b) Long hub, threaded, and specially designed for ductile iron pipe.
 - c) After attaching to pipe, machine flange face to make pipe end and flange even and perpendicular to the axis of the pipe.
 - b. Bolt Holes: Two-holed and aligned at both ends of pipe.
 - c. Cap Screw or Stud Bolt Holes: Tapped.
 - d. Bolts and Nuts: ANSI/ASME B 16.1 or when connecting flanges underwater, Type 304 or Type 316 stainless steel; bolts and studs machined heavy hex heads, threads in accordance with ASME/ANSI B1.1 cut and finished to project a maximum of 1/4 inch beyond nut when joints are assembled. Grease and tape wrap steel materials for protection against corrosion after piping installation.
 - e. Gaskets: As specified in accordance with Section 331112.
 - 2. Mechanical Joints: AWWA C 111/ANSI A 21.11

3. Restrained Mechanical Joints: Shall be capable of restraining pipeline pressure. Manufacturers: One of the following or equal:
 - a. EBAA Iron Sales Inc., Mega Lug.
 - b. American Cast Iron Pipe Company, LOK-Fast or Lugged Fastite.
 - c. Pacific States Cast Iron Pipe Company, Restrained Tyton or Lock Mechanical.
4. Push-On Rubber Gasket Joints: AWWA C 111/ANSI A 21.11.
5. Restrained Push-On Joints:
 - a. Manufacturers: One of the following or equal:
 - 1) United States Pipe and Foundry Company, TR Flex, comprised of ductile iron locking segments inserted through slots in the bell face, providing positive axial lock between the bell interior surface and a retainer weldment on the spigot end of the pipe, or a retainer weldment through a boltless system, providing a positive restraint against joint separation; with a safety factor of 2 under a pressure equal to the specified test pressure; capable of easy disassembly without cutting or burning of the gasket.
 - b. Manufacturers: One of the following or equal: Suitable for the following working pressures:
 - 1) For 4 through 24 inch Pipe: 350 pounds per square inch gauge.
6. Grooved Joints: AWWA C 606, as complemented and modified below, radius-cut type, with following components:
 - a. Couplings: Rigid type, cast from ductile iron in accordance with ASTM A 536, Grade 65-45-12 or malleable iron in accordance with ASTM A 47, Grade 32510.
 - b. Bolts and nuts in accordance with ASTM A 183, Grade 2.
 - c. Gaskets: Capable of being applied on surface of piping with cavities to provide for an improved seal with the internal piping pressure; material for following services:
 - 1) For Liquid Service: Halogenated butyl.
 - 2) For Air Service: Fluoroelastomer.
 - 3) For Hot Water Service: EPDM
 - d. Fittings: AWWA C 606, rigid radius-cut groove.
 - 1) Center-to-Center Dimensions: AWWA C 110/ANSI A 21.10.
 - 2) Wall Thickness and Other Characteristics: AWWA C 153.
 - e. Flanged Unit Connections: Flanged to grooved joint adapters or a long enough spool with 1 end flanged and the other grooved to prevent interference with the operation of adjacent valves, pumps, or other items.

2.02 ACCESSORIES

- A. Fittings: AWWA C 110/ANSI A 21.10 or AWWA C 153/ANSI A 21.53 with the same pressure rating and joint configuration as that of the associated piping.
- B. Flexible Couplings: AWWA C 219, Install as shown on the drawings.
 1. Flexible Couplings: galvanized when on galvanized pipe or pipe which are epoxy or cement lined or when underground.
 2. They shall have a minimum pressure rating of 200 psi.

3. Where flexible couplings are installed underground, Type 316 stainless steel grade B-8M, Class 2 bolts shall be used. The entire couplings shall be given a 2" bitumastic coating.
4. Insertion depth of the pipe in the coupling shall be controlled by a gauge mark or mechanical stop in the coupling which will allow for thermal expansion and contraction.

C. Cleanouts: As shown on the Drawings.

2.03 PIPE LININGS

A. Cement-Mortar Lining and Coating: AWWA C 104/ANSI A 21.4, applied on clean bare metal surfaces; extended to faces of flanges, ends of spigots, and shoulders of hubs; painted with bituminous material.

1. Coating on Cement-Mortar Coating: Bituminous material, or none when specified to receive another coating.

2.04 MARKINGS

A. Pipe markings shall include the following, marked continuously down the length:

1. Weight
2. Class or nominal thickness
3. Casting period
4. Manufacturers mark and year in which pipe was produced
5. The letters "DI" or "Ductile" are cast or stamped on the pipe
6. All marks are on or near the bell

PART 3 EXECUTION

3.01 INSTALLATION

A. General:

1. Install ductile iron piping in accordance with AWWA C 600, modified as specified in Section 331112.
2. Lay mechanical joint or bell and spigot pipe with 1/8 inch space between the spigot and shoulder of the pockets.

3.02 JOINTS

A. Install types of joints as specified in piping schedule in Section 331112.

3.03 GROOVED JOINTS

- A. Install piping with grooved joints where specified or indicated on the Drawings.
- B. Assemble grooved joints in accordance with manufacturer's published instructions.

- C. Support grooved-end pipe in accordance with manufacturer's published instructions. Install at least 1 support between consecutive couplings.
- D. Install flanged or grooved joints where flanged joints are scheduled, except under the following conditions:
 - 1. In underground and underwater installations.
 - 2. In piping subject to test pressure of 150 pounds per square inch gauge or more.
 - 3. When wall thickness of pipe is less than the minimum recommended in published instructions by the manufacturer of the grooved end coupling.
- E. Make connections to flanged valves, pumps and piping appurtenances by either:
 - 1. Flanged-to-grooved joint adapters.
 - 2. Flanged-by-grooved end pipe spool of sufficient length to prevent interference with the operation of adjacent valves, pumps or other items.
 - 3. Integrally cast flanged-by-grooved end pipe fittings.

3.04 FIELD QUALITY CONTROL

- A. Test ductile iron piping as specified in Section 331125.
- B. Do not test sections longer than 1/2 mile in total pipe length.

END OF SECTION