

REQUEST FOR A WAIVER FROM THE AMERICAN IRON AND STEEL REQUIREMENT

This request for a waiver from the American Iron and Steel requirement is completed by a SRF funding recipient when there is a need to use foreign made iron/steel component and the conditions of Section 436 are met.

This waiver requested based on:

- Public Interest (complete sections A and B below)
- Availability (complete sections A and C below)
- Cost (complete sections A and D below)

Section A – General

Describe the unit process which contains the proposed foreign-made iron/steel component

The Peru Utilities loan, (DW17065202) financed multiple projects in SFY 2018 to complete improvements to the distribution system and water treatment plant in Peru. The Wayne Street Wabash River Crossing project is one component of this loan, which will allow the area on the south side of the Wabash River to provide water to their customers with larger and more reliable HDPE water mains.

The Wayne Street Wabash River Crossing project includes abandoning the existing 16-inch and 12-inch mains in-place and replacing them with a 20-inch HDPE main under the Wabash River where one connection will be located east of Wayne Street and south of Canal Street on the north side of the river and the other connection will be located near the intersection of Wayne Street and SR 124 on the south side of the river; and installing a 16-inch PVC main where one connection will be located between the new 20-inch HDPE main and an existing 16-inch water main on the south side of the river and the other connection will be located between the new 20-inch HDPE main and existing 12-inch line on the north side of the river.

The project required a specific 20" x 16" ductile iron fitting. A domestic supply of this fitting is not readily available and cannot be delivered to the project site quickly enough to meet the project timeline.

Section B – Public Interest (N/A)

Why is the use of the product in the public interest? For example, is the use of a foreign made iron/steel component necessary because of compatibility with existing components in the wastewater system or other reason?

Section C – Availability

Describe requirements in the project plans, specifications or permits which describe the required quantity and quality of the product:

At the Wabash River Water Main Crossing, the project requires 20" x 16" reducers in the water main. The components were ordered in May of 2021. The supplier notified the Utility on August 3rd that they have exhausted their resources attempting to locate a 20" x 16" reducer that will meet the needs of the project. All domestic options that were identified have a delivery time of 16-weeks or more. The supplier can identify nondomestic 20" x 16" reducers that would meet the needs of the project that are readily available.

The original project timeline (attached) intended work to begin August 2021. The City of Peru has a future bridge project scheduled to begin construction September 2021 at the same site of work. The bridge project

requires a significant portion of the Wabash River Crossing to be complete before work can begin. These goals will not be possible if the Utility must hold construction for four additional months awaiting the delivery of the domestic fitting.

- Product requirements: Specifications for the reducers are attached to this document.
- Quantity: two
- Price:
 - Sigma - \$ [REDACTED]
 - Tyler Union - \$ [REDACTED]

Domestic product manufacturer with 16-week lead time – Sigma and Star Pipe

Nondomestic product manufacturer available – Tyler Union (1501 W 17th St, Anniston, AL 36201)

Section D – Cost (N/A)

Cost of project with domestic components \$ _____

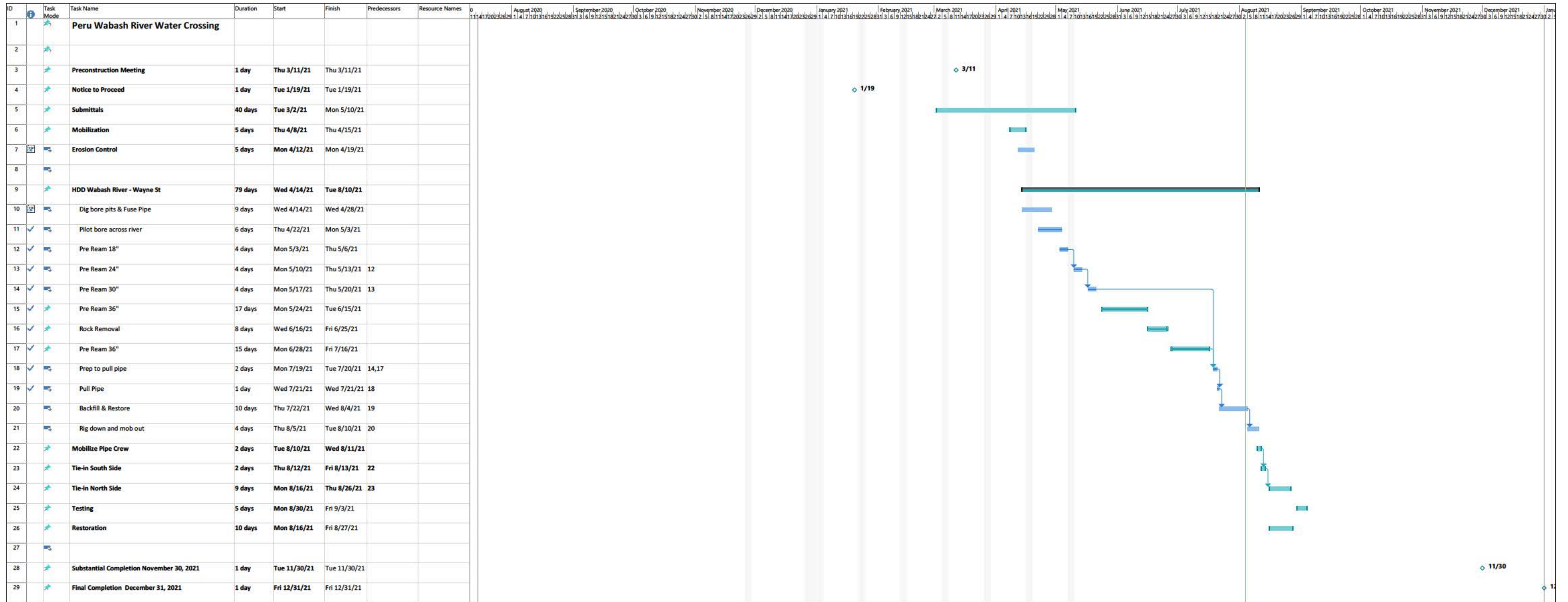
Cost of project with foreign made components \$ _____

Will the use of domestic components increase the project cost by more than 25%?

Yes No

If No, cost is not a valid basis. If Yes, attach a detailed cost comparison of the domestic and foreign made options.

This waiver request was submitted to the EPA by the state of Indiana. All supporting correspondence and/or documentation from contractors, suppliers or manufacturers included as a part of this waiver request was done so by the recipient to provide an appropriate level of detail and context for the submission. There may be documents with project diagrams, schedules, and supplier correspondence in formats that do not meet the Federal accessibility requirements for publication on the Agency's website. Hence, these exhibits have been omitted from this waiver publication. They are available upon request by emailing DWSRFWaiver@epa.gov.



SECTION 33 00 00

BURIED PIPING AND APPURTENANCES

PART 1—GENERAL

1.01 SUMMARY

- A. Work Included:
 - 1. All underground piping and valves of every description.
 - 2. Excavation, dewatering, and backfilling for all work under this section unless otherwise noted.
 - 3. Concrete reaction blocking, gaskets, and all miscellaneous equipment furnished under this section.
 - 4. Underground piping connections to all equipment, whether furnished under this section or not.
- B. Related Sections and Divisions: Applicable provisions of Division 01 shall govern work in this section.

1.02 REFERENCES

- A. ASTM D2774—Standard Test Method for Oxidation Stability of Distillate Fuel Oil.
- B. AWWA C151—American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
- C. AWWA C150—Thickness Design of Ductile-Iron Pipe.
- D. AWWA C110—Ductile-Iron and Gray-Iron Fittings.
- E. AWWA C111—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
- F. AWWA C153—Ductile-Iron Compact Fittings.
- G. AWWA C104—Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.
- H. ASTM F405—Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.
- I. ASTM F667—Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings.
- J. ASTM F449—Standard Practice for Subsurface Installation of Corrugated Polyethylene Pipe for Agricultural Drainage or Water Table Control.
- K. ASTM D3034—Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- L. ASTM F679—Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.

- M. ASTM D1784—Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- N. ASTM D2412—Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
- O. ASTM D3212—Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- P. ASTM F477—Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- Q. ASTM D2564—Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
- R. AWWA C900—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-Inch through 12-Inch for Water Transmission and Distribution.
- S. AWWA C-905—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-Inch through 48-Inch for Water Transmission and Distribution.
- T. ASTM C76—Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- U. ASTM C507—Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe.
- V. ASTM C443—Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
- W. ASTM D2513—Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings.
- X. ASTM D3350—Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
- Y. ASTM D3261—Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
- Z. ASTM D2683—Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
- AA. AGA XR0603—American Gas Association Plastic Pipe Manual for Gas Service.
- BB. ASTM C-478—Standard Specification for Circular Precast Reinforced Concrete Manhole Sections.
- CC. AWWA C105—Polyethylene Encasement for Ductile-Iron Pipe Systems.
- DD. AWWA C600—Installation of Ductile Iron Water Mains and Their Appurtenances.
- EE. AWWA C605—Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.

FF. ASTM C12–Standard Practice for Installing Vitrified Clay Pipe Lines.

GG. ASTM C33–Standard Specification for Concrete Aggregates.

HH. AWWA C651–Disinfecting Water Mains.

1.03 CODES AND STANDARDS

- A. Before any polyethylene fusion welding is performed, CONTRACTOR shall submit certification that the welders to be used on this project have successfully demonstrated proper welding procedures in accordance with the Code of Federal Regulations, Title 49, Part 192, Section 192.285.

PART 2–PRODUCTS

2.01 MATERIALS OF CONSTRUCTION

- A. All materials used in the manufacture, assembly, and painting of piping and valves in contact with water shall be compatible with potable water supplies and in contact with chemical feed systems shall be compatible with the chemicals being used. All glues, solvents, solders, etc., shall likewise be compatible. For instance, no lead-base solders shall be used. All materials shall be National Sanitation Foundation (NSF)-approved.
- B. Size and Type:
1. All materials shall conform to the size and type shown on the drawings or called for in the specifications.
 2. In joining two dissimilar types of pipe, standard fittings shall be used when available. In the event standard fittings are not available, the method of joining shall be standard selected by CONTRACTOR and submitted for review by ENGINEER.
- C. Piping appurtenances shall be made of the materials specified. All appurtenances not designated as to type shall be selected by CONTRACTOR and submitted for review by ENGINEER.

2.02 BURIED PIPING

- A. Ductile Iron Piping and Fittings:
1. Unless otherwise specified, all exterior piping shall conform to AWWA C151 with wall thickness provided in accordance with AWWA C150 for the depth of cover shown on the drawings using a minimum rated working pressure of 350 psi and Laying Condition 4; unless otherwise shown or specified. The words “ductile iron,” weight and class of pipe shall be plainly marked on each piece of exterior pipe.
 2. Except where shown, exterior pipe joints shall be mechanical joint or push-on joint. All mechanical and push-on joints with TR flex restraints shall be bonded with cable bond conductors or electrobond conductivity strips. All joints and fittings shall be restrained as specified herein.
 3. Exterior joints and gaskets shall conform to AWWA C110 and C111.
 4. Bolts on exterior joints shall be high-strength low-alloy stainless steel (Corten, or equal), conforming to AWWA C111. Certificate to that effect shall be provided.
 5. Except where shown otherwise, exterior fittings shall be mechanical joint. Exterior fittings and gaskets shall comply with AWWA C110, Ductile Iron Fittings, or C153,

Ductile Iron Compact Fittings, and C111, as applicable, with a minimum rated working pressure of 150 psi.

6. Exterior and/or buried pipe and fittings shall be cement-mortar lined and asphaltic coated inside and asphaltic coated outside. Cement-mortar lining shall be in accordance with AWWA C104. Asphaltic coating shall conform to applicable standards herein for the pipe and fittings.
7. All ductile iron fittings shall be American, Clow, Griffin, Tyler, U.S. Pipe, or equal.
8. Cutting-in and repair tees, sleeves, and tapping tees shall be ductile iron or cast iron in the same rated working pressure of the pipe in which they are installed, but not less than 150 psi.

B. Copper Piping:

1. Copper piping shall conform to the requirements of ASTM B88.
2. Fittings shall be soldered or sweated on and shall be of cast bronze or forged brass containing 85% copper.
3. All underground water supply piping 3 inches or smaller shall be Type K soft copper with compression fittings. Joints shall not be used under floor slabs.
4. Shutoff valves shall be placed on each branch for all underground, aboveground, or interior piping.

C. Tracer Wire:

1. Install 10-gauge solid tracer wire with buried pipe where specified. Wire shall be continuous and terminate at valve boxes, manholes, or at test stations as specified below. Wire shall be taped to pipe at 5-foot intervals for all piping except piping carrying combustible material. For pipe carrying combustible material, the tracer wire shall be placed in the trench directly above the pipe, maintaining 6 inches separation between the tracer wire and the pipe. Any splices in copper wire shall be soldered and fitted with a Raco, or equal, insulated watertight boot.
2. Tracer wire test stations shall be SnakePit magnetized tracer boxes by Copperhead Industries, or equal. Tracer box shall be corrosion-resistant brass wire lugs and wax pad to cover wire connection. Cover shall be color-coded according to APWA standards for fluid conveyed. Provide SnakePit Lite Duty Box in unpaved areas and Roadway Box in paved areas. Provide Rhino Triview Marker Posts, or equal, at all test stations. Provide custom decals to identify fluid in piping. The tracer wire shall be accessible at a minimum of every 500 feet along the pipeline and at horizontal bends in piping. The tracer wire shall run into and up the sides of all manholes and be secured near the casting. Test stations shall be placed as required between manholes to comply with the minimum 500-foot tracer wire accessibility requirement.
3. CONTRACTOR shall perform continuity testing of all tracer wire in the presence of OWNER.

2.03 VALVES

- A. Valves: Valves and accessories for underground service are specified in Section 40 05 01—Piping and Accessories.

2.04 FIRE HYDRANT

A. Fire Hydrant:

1. Fire hydrant shall be Waterous W-67 Pacer with 5-inch barrel, compression shutoff, two 2 1/2-inch and one 4 1/2-inch nozzles with three chains and Waterous No. 2 nut.
2. Hydrant to be built for 6-foot 6-inch bury and be painted as stated in drawings.

3. About 1/2 cubic yards of coarse gravel shall be placed from the bottom of the trench up the hydrant barrel. Brace with solid concrete block not concrete.

PART 3–EXECUTION

3.01 INSTALLATION

A. General Excavation:

1. CONTRACTOR shall do all excavation, undercutting, dewatering, and backfilling necessary for work under this Contract, unless otherwise noted.
2. Work shall conform to other sections of Division 31 except where modified by this section.
3. The width of trench below the top of the pipe shall not exceed the nominal diameter of the pipe plus 2 feet for all pipelines.
4. Where the maximum trench width is exceeded, the pipe shall be placed in a concrete cradle or a stronger pipe used as necessary.
5. If the maximum trench width is exceeded for any reason other than by request of ENGINEER, the concrete cradle or the stronger pipe shall be placed at CONTRACTOR's expense.
6. Excavation shall include all necessary clearing of excavated areas, tree removal, all grubbing, all wet, dry, fill, and rock excavation, the removal of pavement, and all incidental work thereto. All above work shall be included in the Unit Price Bid except unsuitable soils excavation and rock excavation as defined in Section 31 23 00-Excavation, Fill, Backfill, and Grading and of pipe linear foot installation.
7. CONTRACTOR shall excavate whatever materials are encountered as required to place at the elevations shown, all pipe, manholes, and other work as required to complete the project as shown.
8. The bottom of the excavation shall be leveled off, all loose and disturbed soil shall be removed, and it shall be hand-tamped prior to pipe, manhole, etc., installation. Where requested by ENGINEER, original material below the excavation necessary for construction according to grades shown or specified shall be removed and replaced with material and placing methods as specified in Section 31 23 00–Excavating, Fill, Backfill, and Grading.
9. The excavation at the crossing of all underground utility services in place shall be as narrow as practicable.
10. All underground services shall be protected from damage and maintained in service at their original location and grade during the process of the work.
11. Any damage to underground services shall be replaced or repaired at no cost to OWNER or to the owner of the service.
12. The present underground services shown on the drawings are located in accordance with available data.
13. Encountering these services at a different location or encountering services not shown shall not release CONTRACTOR from the above-stated conditions.
14. Any service connections encountered which are to be removed shall be cut off at the limits of the excavation and capped in accordance with the requirements of owners of such connections.
15. Excavated material that is unsuitable or not required for filling shall be wasted.
16. Materials to be used for fill and suitable for this purpose shall be deposited where required, except that no fill shall be placed where trenches for sewers, water lines or other services will be located until after the trench work is completed.

17. CONTRACTOR shall provide adequate shoring, sheet piling, and bracing to prevent earth from caving or washing into the excavation and shall do all shoring and underpinning necessary to properly support adjacent or adjoining structures. All shoring, sheet piling, and underpinning must be maintained until permanent support is provided.
- B. Laying Pipe:
1. CONTRACTOR shall excavate and lay all pipe to the line and grade shown on the drawings with bell ends uphill.
 2. Grade stakes will be required for all lines.
 3. Water lines shall have a minimum of 5 feet of cover, unless noted otherwise.
 4. Any pipe or fittings cracked in cutting or handling or otherwise not free from defects shall not be used.
 5. Pipe must be kept clean of mortar, cement, clay, sand or other material.
 6. Trenches shall be kept water-free and dry during bedding, laying, and jointing.
 7. CONTRACTOR shall provide, operate, and maintain all pumps or other equipment necessary to drain and keep all excavation pits and trenches and the entire subgrade area free from water under any and all circumstances that may arise.
 8. All trees, shrubs, and improved areas outside the excavation shall be protected from damage.
- C. Restraint Based on Flexible Restrained Joints:
1. Except where noted or indicated, all bends, caps, plugs, tees, and other fittings shall be restrained with flexible restrained joints.
 2. Mechanical joints and ductile iron pipe shall be restrained by MEGALUG® 1100 Series by EBAA Iron Sales, Inc. or equal restraining system.
 3. Ductile iron push-on joint pipe shall be restrained by Lok-Ring Joint by American Ductile Iron Pipe, TRFLEX by U.S. Pipe, MEGALUG® 1700 Series by EBAA Iron Sales, Inc., or equal.
 4. For restrained pipe joints, all underground ductile iron pipe joints (except for the branch of tees and dead ends) shall be restrained. The branch of tees and all dead ends shall be restrained. All joints on yard and fire hydrant leads shall be restrained.
- D. Bedding:
1. All underground pipe shall be bedded in compacted granular material.
 2. Ductile iron piping shall be placed using the bedding details shown on the drawings.
 3. CONTRACTOR shall perform all necessary excavation and shall furnish all required materials to provide bedding material. Bedding material shall conform to the gradation requirements of ASTM C-33.
 4. Bedding material shall be hard, tough, and durable and shall meet the following gradation requirements:
 5. Immediately prior to placing the pipe, bedding shall be shaped by hand to fit the entire bottom quadrant of the pipe between bell holes.
 6. Bell holes shall be large enough to permit proper making of the joint but not larger than necessary to make the joint.
 7. All adjustments to line and grade must be done by scraping away or filling in bedding under the body of the pipe. Bedding must be tamped into place.
 8. If necessary to obtain uniform contact of the pipe with the bedding, a template shall be used.

- E. Cover Material:
1. Material which is to be placed from the bedding material around and to 1 foot above the top of all pipe shall be termed cover material.
 2. Except for copper piping, cover material shall consist of durable granular particles ranging in size from fine to coarse in a substantially uniform combination.
 3. Unwashed bank run sand and crushed bank run gravel will be considered generally acceptable for cover material.
 4. No stones larger than 3/4 inches in their greatest dimension shall be allowed in the cover material.
 5. Native materials may be used if they conform to the above specifications.
 6. Cover material for copper piping shall be sand.
 7. Cover material shall be deposited in the trench for its full width on each side of the pipe, fittings, and appurtenances simultaneously.
 8. Granular cover material shall be placed over the top of the pipe to the height as shown on the drawings.
 9. This cover material shall be placed by hand in 6-inch layers and shall be compacted using hand-tamping bars and/or mechanical tampers.
 10. If bedding material, except sand, conforming to any of the above three gradations under "Bedding" is used as cover material, it need not be tamped.
 11. Sand cover material must be tamped.
 12. Unless sand backfill is required, the remaining 6 inches to make up the required 1 foot of cover material shown on the drawings shall be granular material specified previously with no stones larger than 3/4 inch.
 13. Compaction shall be equivalent to that described under "Filling and Backfilling" in these specifications.
- F. Backfill: Except as otherwise specified, all backfill above 1 foot above the pipe shall be granular material specified in Section 31 23 00—Excavation, Fill, Backfill, and Grading. Compaction shall be as specified herein.

3.02 REPAIR/RESTORATION

- A. Upon completion of the work, all improvements disturbed by CONTRACTOR's operations shall be repaired or replaced, including all site improvements, landscaping, and/or paving material as existed prior to construction.

3.03 FIELD QUALITY CONTROL

- A. Site Tests:
1. CONTRACTOR shall include the cost of all testing, cleaning, and disinfection in the price bid.
 2. All piping shall be subject to test before being covered with base course or pavement. All piping and appurtenances shall be watertight or airtight and free from visible leaks.
 3. All piping and appurtenances shall be flushed or cleaned after installation prior to testing.
 4. When test medium for piping is water, all air shall be removed from piping by flushing and/or installation of corporations at high points in system. Presence or absence of air will be determined during pressurization of the piping system.
 5. CONTRACTOR shall provide all necessary piping connections, water, air, test pumping equipment, water meter, bulkheads, valves, pressure gauge, and other equipment, materials, and facilities necessary to complete the specified tests. CONTRACTOR shall provide all temporary sectionalizing devices and vents for

testing. Note, when pressure testing against existing valves or piping, CONTRACTOR shall assume these items will fail and provide temporary plugging or valving as required.

6. Pressure Tests: The test pressure in all nongravity lines shall be held for one hour during which time the leakage allowance shall not exceed that specified. In case repairs are required, the pressure test shall be repeated until the pipeline installation conforms to the specified requirements. Pumps, air compressors, instrumentation, and similar equipment shall not be subjected to the pressure tests.
7. Test Requirements:

Fluid Abbreviation or Name	Minimum Test Pressure in psi	Test Medium	Leakage Allowance Designation
Potable Water	150	Water	"A"

8. Leakage allowance Designation "A" shall be not more than 0.002 gallon per hour per inch diameter per 100 feet of buried pipe for compression or solder joint pipe. Buried mechanical and push-on joint pipe shall meet the leakage specifications of AWWA C600.

3.04 CLEANING AND DISINFECTION

- A. All equipment and materials shall be clean before installation. CONTRACTOR shall disinfect and flush the system before it is put on line. Water main, including buried and exposed piping, shall be disinfected according to AWWA C651.
- B. In accordance with the requirements of AWWA C651, at least one set of samples shall be collected from every 1,200 feet of new water main, plus one set from the end of the line and at least one set from each branch.
- C. CONTRACTOR shall obtain water samples and arrange for analysis of water in potable systems for bacteria in accordance with Option A of Section 5.1 of AWWA C651. Copies of test results shall be submitted to OWNER and ENGINEER.
- D. Broken concrete, rubble fill, and other excess material shall be removed from the site and wasted.
- E. All waste disposal areas and all areas used for the storage of materials or the temporary deposit of excavated earth shall be leveled off, cleaned up, and returned to condition that existed prior to construction.
- F. All surplus material, tools, and equipment shall be removed, and the premises shall be left free of everything of the kind.

END OF SECTION

SECTION 40 05 01

PIPING AND ACCESSORIES

PART 1–GENERAL

1.01 SUMMARY

- A. Work Included: Valves and Accessories for underground service.
- B. Related Sections and Divisions: Applicable provisions of Division 01 shall govern work in this section.

1.02 REFERENCES

- A. ANSI B16.1–Cast Iron Pipe Flanges and Flanged Fittings.
- B. ANSI B16.9–Factory-Made Wrought Steel Buttwelding Fittings.
- C. API 5L–Specification for Line Pipe.
- D. ASME B31–Standards of Pressure Piping.
- E. ASTM A36–Standard Specification for Carbon Structural Steel.
- F. ASTM A48–Standard Specification for Gray Iron Castings.
- G. ASTM A53–Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- H. ASTM A74–Standard Specification for Cast Iron Soil Pipe and Fittings.
- I. ASTM A126–Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
- J. ASTM A139–Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over).
- K. ASTM A536–Standard Specification for Ductile Iron Castings.
- L. ASTM A563–Standard Specification for Carbon and Alloy Steel Nuts.
- M. ASTM B88–Specification for Seamless Copper Water Tube.
- N. ASTM B271–Standard Specification for Copper-Base Alloy Centrifugal Castings.
- O. ASTM B505–Standard Specification for Copper Alloy Continuous Castings.
- P. ASTM C508–Standard Specification for Copper Alloy Strip for Flexible Metal Hose.

- Q. ASTM C564—Standard Specification for Rubber Baskets for Cast Iron Soil Pipe and Fittings.
- R. ASTM D1784—Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
- S. ASTM D1785—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Schedules 40, 80, and 120.
- T. ASTM D2672—Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement.
- U. ASTM D2467—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- V. ASTM D2464—Standard Specification for Threaded Poly (Vinyl Chloride)(PVC) Plastic Pipe Fittings, Schedule 80.
- W. ASTM D2321—Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- X. ASTM D2564—Standard Specification for Solvent Cements for Poly (Vinyl Chloride)(PVC) Plastic Piping Systems.
- Y. ASTM D2665—Standard Specification for Poly (Vinyl Chloride)(PVC) Plastic Drain, Waste, and Vent Pipe Fittings.
- Z. ASTM D3311—Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns.
- AA. ASTM F436—Standard Specification for Hardened Steel Washers.
- BB. ASTM F656—Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- CC. AWWA C104—American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
- DD. AWWA C110—Ductile-Iron and Gray-Iron Fittings.
- EE. AWWA C115—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
- FF. AWWA C151—American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
- GG. AWWA C200—Steel Water Pipe 6-Inch and Larger.
- HH. AWWA C206—Field Welding of Steel Water Pipe.
- II. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch.
- JJ. AWWA C208—Dimensions for Fabricated Steel Water Pipe Fittings.

- KK. AWWA C500–Metal-Seated Gate Valves for Water Supply Service.
- LL. AWWA C504–Rubber-Seated Butterfly Valves, 3-Inch through 72-Inch.
- MM. AWWA C507–Ball Valves, 6-Inch through 60-Inch.
- NN. AWWA C509–Resilient-Seated Gate Valves for Water-Supply Service.
- OO. NSF Standard 61–Drinking Water Treatment Components: Health Effects.

1.03 SUBMITTALS

- A. Shop Drawings: General arrangement drawings of all interior cast or ductile iron or steel piping with all equipment attached shall be submitted to ENGINEER for approval prior to installation. Additional shop drawing requirements are found in the General Conditions and Division 01. Drawings shall include proposed length, location and elevation of pipe, fittings, valves, and other appurtenances.

PART 2–PRODUCTS

2.01 MATERIALS–GENERAL

- A. All materials used in the manufacture, assembly, and painting of piping and valves in contact with water shall be compatible with potable water supplies and in contact with chemical feed systems shall be compatible with the chemicals being used. All glues, solvents, solders, etc., shall likewise be compatible. For instance, no lead-base solders shall be used. All materials shall be National Sanitation Foundation (NSF) approved.
- B. Size, Type, and Joining:
 - 1. All materials shall conform to the size and type shown on the drawings or called for in the specifications.
 - 2. In joining two dissimilar types of pipe, standard fittings shall be used when available. In the event fittings are not available, the method of joining shall be selected by CONTRACTOR and submitted to ENGINEER for review.
- C. Piping appurtenances shall be made of the materials specified. All appurtenances not designated as to type shall be subject to approval of ENGINEER.

2.02 VALVE MATERIALS

- A. Gate Valves:
 - 1. Where shown or specified, gate valves in lines 4 inches through 12 inches in diameter or larger, shall be AWWA C509 iron body, resilient-wedge, nonrising stem, 150 psi working pressure, with O-ring above and below the thrust collar.
 - 2. All interior valves shall be flanged and have handwheels. Right-angle operators shall be provided, if required, because of valve position. Handwheels shall be ductile iron or gray iron.
 - 3. Underground valves shall have either mechanical joints or push-on joints, extended stem for maximum depth of 5 feet from operating nut to surface, valve box, and key. Valve boxes shall be cast iron telescopic-adjustable, as specified herein.

4. Shutoff valves in water lines 3 inches to 1 inch in diameter shall be gate valves, Class 150-pound bronze, or iron body bronze-mounted, solid-wedge disc, threaded, rising stem. Provide unions for ease of valve removal.

2.03 VALVE BOXES

- A. A valve box shall be provided for fire hydrant auxiliary valves and valves in the main. The valve box shall be centered and plumb over the wrench nut of the valve with the box cover flush with the finished ground elevation. Solid 4-inch concrete blocks shall be placed under the base of the valve boxes so that the bottom of the base is about 2 inches away from contact with the valve bonnet. The valve box shall not transmit shock or stress to the valve.
- B. Valve boxes shall be made of cast iron conforming to ASTM A48. The castings shall be free from blowholes, porosity, hard spots, shrinkage defects or cracks, or other injurious defects, and shall have a normal smooth-casting finish. The castings shall be thoroughly coated with a 1 mil minimum thickness bituminous coating. Valve boxes shall be 5 1/4 inches in diameter. Valve boxes shall have a maximum length of 7 feet when extended without extension sections.
- C. Valve boxes shall consist of a base section, tubular mid and top sections, both with cast threads by which one can be telescoped on the other, extension sections if required, and a circular drop cover.
- D. Valve box alignment devices: All valves shall be supplied with a gate valve adaptor as manufactured by Adaptor, Inc., or equal. All adaptors shall have a metal frame and be supplied with a 3/4-inch rubber gasket. All adaptors shall be sized to fit the brand of valve being supplied.

2.04 MATERIALS–NONSHRINK MORTAR

- A. Nonshrink mortar shall be All-Crete as manufactured by Concrete Products, Inc., Woodland, California; Speed Crete as manufactured by Tamms Industries Co., Itasco, Illinois; or equal. Nonshrink mortar shall be placed in accordance with manufacturer's recommendations.

2.05 EQUIPMENT–WATER METERS

- A. Leak Detection Meter and Meter Pit:
 1. The ball angle meter Mueller Model No. B24273N or Ford Model No. BA94-444W-NL shall be provided by OWNER and installed as described within the drawings.
 2. The meter bit shall be Ford Meter Box Company Model No. W3 x 20", Mueller Model No. H-10184 x 20", or equal, and installed as described in the drawings.

PART 3–EXECUTION

3.01 INSTALLATION

- A. Installation of pipes shall be in accordance with Section 33 00 00.

3.02 FIELD QUALITY CONTROL

- A. Field quality control of pipes shall be in accordance with Section 33 00 00.

3.03 CLEANING AND DISINFECTION

- A. Cleaning and disinfection of pipes shall be in accordance with Section 33 00 00.

END OF SECTION