

SECTION 22 11 13
WATER SERVICE SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe and fittings for site domestic water line.
- B. Valves and fire hydrants.
- C. Bedding and cover.

1.2 REFERENCES

- A. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18-inch Drop.
- B. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
- C. AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for water and Other Liquids.
- D. AWWA C111 - Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.
- E. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
- F. AWWA C500 - Gate Valves, 3 and up in NPS, for Water and Sewage Systems.
- G. AWWA C502 - Dry Barrel Fire Hydrants.
- H. AWWA C504 - Rubber Seated Butterfly Valves.
- I. AWWA C600 - Installation of Ductile-Iron Water Mains and Appurtenances.
- J. AWWA C900 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.
- K. UL 246 - Hydrants for Fire Protection Service.
- L. Standard Specification for Sewer and Water Construction in Wisconsin.

1.3 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.

1.4 PROJECT CLOSEOUT SUBMITTALS

- A. Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with "Standard Specifications for Sewer and water Construction in Wisconsin."
- B. Valves/Hydrants: Manufacturer's name and pressure rating marked on valve body.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves/hydrants in shipping containers with labeling in place.

PART 2 PRODUCTS

2.1 WATER PIPE

- A. 3" and over:
 - 1. Pipe: Ductile iron AWWA C151 with AWWA C104 cement mortar lining Class 55.
 - 2. Fittings: Ductile iron, standard thickness.
 - 3. Joints: AWWA C111, rubber gasket joint, mechanical restrained.
 - 4. Jackets: AWWA C105 polyethylene jacket, double layer, half lapped, 10 mil polyethylene tape.

2.2 VALVES - NOT USED

2.3 HYDRANT

- A. Manufacturers:
 - 1. Kennedy Valve Guardian K-81 D (4-inch) fire hydrant, or VA-approved equal.
- B. Hydrant: AWWA C502, UL, 246, dry barrel type, mechanical joint inlet connection with accessories, gland bolts, and gaskets.
- C. Hydrant Extensions: Fabricate in multiples of 6 inches with rod and coupling to increase barrel length.
- D. Hose and Streamer Connection: Match sizes with VA, two 2-1/2" hose/pumper nozzles.
- E. Finish: Primer and two coats of enamel in color required by VA.

2.4 BEDDING AND COVER MATERIALS

- A. Bedding shall be the 4" deep material between the bottom of the evacuation and the bottom of the pipe.
 - 1. Fill Type A2 as specified in Section A15110.
- B. Cover shall be from the bottom of the pipe to 12" over the top of the pipe.
 - 1. Fill Type A2 as specified in Section A15120.
- C. Backfill: Refer to Section 31 20 00.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that fire hydrant isolation valve and VA utility water main size and location are as indicated.

3.2 PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on side and outside before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

- A. Excavate pipe trench in accordance with other sections. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth; compact to 95 percent.
- C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact to 95 percent.
- D. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Maintain separation of water main from sewer piping in accordance with required codes and regulations.
- B. Install pipe to indicate elevation to within tolerance of one inch.
- C. Install ductile iron piping and fittings to AWWA C600.
- D. Route pipe in straight line.
- E. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- F. Install access fittings to permit disinfection of water system.
- G. Slope water pipe and position drains at low points.
- H. Establish elevations of buried piping to ensure not less than 6 feet of cover.
- I. Install trace wire continuous over top of pipe.
- J. Backfill trench in accordance with other sections.

3.5 INSTALLATION - VALVES AND HYDRANTS

- A. Set valves on solid bearing base.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.
- D. Set hydrants to grade, with nozzles at height above ground as required by plans.
- E. If required, locate control valve minimum 12 inches away from hydrant.
- F. Provide a drainage pit 36 inches square by 24 inches deep filled with 2 inch washed gravel. Encase elbow of hydrant in gravel to 6 inches above drain opening. Do not connect drain opening to sewer.

3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Flush and disinfect system in accordance with AWWA C651.

3.7 SERVICE CONNECTIONS - NOT REQUIRED

- A. Provide water service to 6" above finished floor within the building, where indicated.

3.8 FIELD QUALITY CONTROL

- A. Compaction testing will be performed in accordance with ASTM D1557.

- B. If tests indicate work does not meet specified requirements, remove work, replace and retest.

3.9 PRESSURE AND LEAKAGE TEST

- A. Perform in accordance with AWWA C600-87.

END OF SECTION