SECTION 21 11 00
FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Contracting Requirements and Division 01 General Requirements apply to this Section.

1.02 SUMMARY

A. Section includes fire-suppression water-service piping and related components outside the building and service entrance piping into the building

PART 2 - PRODUCTS

2.01 DUCTILE-IRON PIPE AND FITTINGS

A. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

B. Flanges: ASME B16.1, Class 125, cast iron.

2.02 SPECIAL PIPE FITTINGS

A. Ductile-Iron Deflection Fittings:

2.03 JOINING MATERIALS

A. Gaskets for Ferrous Piping: ASME B16.21, asbestos free.

2.04 PIPING SPECIALTIES

A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

B. Tubular-Sleeve Pipe Couplings.

2.05 GATE VALVES

A. UL-Listed and FM-Approved, OS&Y Bronze, Gate Valves.

2.06 GATE VALVE ACCESSORIES AND SPECIALTIES

A. Indicator Posts.

2.07 BUTTERFLY VALVES

A. UL and FM Approved Butterfly Valves.

2.08 CHECK VALVES

A. UL-Listed or FM-Approved Check Valves.

2.09 BACKFLOW PREVENTERS

A. Double-Check, Backflow-Prevention Assemblies:
   1. Standard: ASSE 1015 or AWWA C510.

B. Backflow Preventer Test Kits:
   1. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.10 ALARM DEVICES

A. General: UL 753 and "Approval Guide," published by FM Global, listing, of types and sizes to mate and match piping and equipment.

B. Water-Flow Indicators.

C. Supervisory Switches.

2.11 SLEEVES

A. Cast-Iron Wall-Pipe Sleeves.

B. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

C. Galvanized-Steel-Pipe Sleeves.

2.12 SLEEVE SEALS

A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.

2.13 GROUT

A. Standard: ASTM C 1107, Grade B, posthardening and volume adjusting, dry, hydraulic-cement grout.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Comply with excavating, trenching, and backfilling requirements in Division 31 Section "Earth Moving."

3.02 PIPING INSTALLATION

A. Comply with NFPA 24 for fire-service-main piping materials and installation.

B. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.

C. Comply with requirements in Division 21 Sections for fire-suppression-water piping inside the building.

3.03 JOINT CONSTRUCTION

A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure rating same as or higher than systems pressure rating for aboveground applications unless otherwise indicated.

3.04 ANCHORAGE INSTALLATION

A. Anchorage, General: Install water-distribution piping with restrained joints.
   1. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches in fire-suppression water-service piping according to NFPA 24.

3.05 VALVE INSTALLATION

A. UL-Listed and FM-Approved Gate Valves: Comply with NFPA 24.

B. UL-Listed and FM-Approved Valves Other Than Gate Valves: Comply with NFPA 24.

C. MSS Valves: Install as component of connected piping system.

3.06 DOUBLE CHECK VALVE INSTALLATION

A. Install aboveground.

B. Install for proper direction of flow.

3.07 ALARM DEVICE INSTALLATION

A. General: Comply with NFPA 24 for devices and methods of valve supervision.

B. Supervisory Switches: Supervise valves in open position.

C. Locking and Sealing: Secure unsupervised valves.

D. Pressure Switches: Drill and thread hole in exposed barrel of fire hydrant. Install switch.

E. Water-Flow Indicators: Install in water-service piping in vault. Select indicator with saddle and vane matching pipe size. Drill hole in pipe, insert vane, and bolt saddle to pipe.

F. Connect alarm devices to building's fire-alarm system. Wiring and fire-alarm devices are specified in Division 28 Sections.

3.08 CONNECTIONS

A. Connect fire-suppression water-service piping to utility water main. Use service clamp.

B. Connect fire-suppression water-service piping to interior fire-suppression piping.

3.09 SLEEVE INSTALLATION

A. General Requirements: Install sleeves for pipes and tubes passing through penetrations in exterior walls.

3.10 SLEEVE SEAL INSTALLATION

A. Install sleeve seals in sleeves in exterior concrete walls at fire-suppression water-service piping entries into the building.

3.11 FIELD QUALITY CONTROL

A. Use test procedure prescribed by authorities having jurisdiction.

3.12 IDENTIFICATION

A. Install continuous underground warning tape during backfilling of trench for underground fire-suppression water-service piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Division 31 Section "Earth Moving."

3.13 CLEANING

A. Clean fire-suppression water-service piping as follows:

3.14 PIPING SCHEDULE

A. Underground fire-suppression water-service piping shall be one of the following:
   1. Mechanical-joint, ductile-iron pipe; mechanical-joint, ductile- or gray-iron, standard-pattern or ductile-iron, compact-pattern fittings; glands, gaskets, and bolts; and gasketed joints.

B. Underground fire-suppression water-service shutoff valves NPS 3 and larger shall be one of the following:
   1. 175-psig, UL-listed or FM-approved, iron, nonrising-stem gate valves.

C. Indicator-post underground fire-suppression water-service valves NPS 3 and larger shall be 175-psig , UL-listed or FM-approved, iron, nonrising-stem gate valves with indicator-post flange.

D. Fire-suppression water-service check valves NPS 3 and larger shall be one of the following:
   1. UL-listed or FM-approved detector check valves.

END OF SECTION 21 11 00