

**SECTION 33 1119
FIRE SUPPRESSION WATER SYSTEM**

PART 1 - GENERAL

1.1 SUMMARY.

- A. Section includes fire water systems.
- B. Related Sections:
 - 1. Division 31 Section "Earthwork" for excavation and backfill required for fire water systems; not work of this section.
 - 2. Refer to fire suppression sections for interior building systems including sprinklers and standpipes; this work is not included in this section.
 - a. Refer to Division 21 Section Fire Suppression. Exterior water piping shall meet all requirements of this section. Test certificates are required.

1.2 QUALITY ASSURANCE

- A. Codes and Standards:
 - 1. NFPA Compliance: Install fire water systems in accordance with NFPA 24 "Standard for Installation of Private Fire Service Mains and Their Appurtenances.
- B. Local Fire Department/Marshall Regulations: Comply with governing regulations pertaining to hydrants, including hose unit threading and similar matching of connections.
- C. UL Compliance: Provide fire hydrants that comply with UL 246 "Hydrants for Fire-Protection Service", and are listed by UL.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for fire water system materials and products.
- B. Maintenance Data: Submit maintenance data and parts lists for fire water system materials and products. Include this data, product data, shop drawings, and record drawings in maintenance manual; in accordance with requirements of Division 1.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

- A. Acceptable manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. Line Markers:
 - a. Allen Systems Inc.
 - b. Seton Name Plate Corp.
 - c. Equal product as approved by Architect.
 - 2. Pipe Strainers:
 - a. "Automatic" Sprinkler Corp. of America; Div. A-T-O Inc.
 - b. Cleveland Gear Co.; Sub of Vesper Corp.
 - c. Grinnell Fire Protection Systems Co., Inc.

- d. Hersey Products Inc.; Hersey Div.
 - e. Mueller Steam Specialty; Div. of Core Industries Inc.
 - f. Neptune Water Meter Co.
 - g. Rockwell International Corp.; Municipal & Utility Div.
 - h. Rockwood Systems Corp.
 - i. Zurn Industries Inc.; Fluid Handling Div.
3. Detector Meter:
- a. Hersey Products Inc.
4. Gate Valves:
- a. American Valve Mfg. Corp.
 - b. American-Darling Valve; Div. of American Cast Iron Pipe Co.
 - c. Clow Corp.; Valve Div.
 - d. Fairbanks Co.
 - e. Kennedy Valve; Div. of ITT Grinnell Valve Co., Inc.
 - f. Stockham Valves & Fittings Inc.
 - g. United Brass Works Inc.
 - h. United States Pipe and Foundry Co.
 - i. Waterous Co.
5. Check Valves:
- a. American-Darling Valve; Div. of American Cast Iron Pipe Co.
 - b. Clow Corp.; Valve Corp.
 - c. Fairbanks Co.
 - d. Kennedy Valve; Div. of ITT Grinnell Valve Co., Inc.
 - e. Mueller Co.
 - f. Nibco Inc.
 - g. Stockham Valves & Fittings Inc.
 - h. Walworth Co.
 - i. Waterous Co.
6. Fire Hydrants: As approved by authority having jurisdiction.

2.2 PIPES AND PIPE FITTINGS:

- A. Provide materials and products complying with NFPA 24 where applicable. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in fire water piping systems. Where more than one type of materials or products are indicated, selection is Installer's option.
- B. Piping: Provide pipe fittings and accessories of same material and weight/class as pipes, with joining method as indicated. Minimum size of Fire Main serving Building Fire sprinkler system on Fire Hydrants shall be 6 inches in diameter.
 - 1. Ductile Iron Pipe: AWWA C151, with cement mortar lining complying with AWWA C104; Class 51 unless otherwise indicated.
 - a. Fittings: Ductile-Iron complying with AWWA C110, cement lined, with rubber gaskets conforming to AWWA C111.
 - 2. PVC Pipe: AWWA C-900, Class 150 unless otherwise indicated.
 - a. Fittings: Schedule 80 PVC fittings complying with ASTM 1785.

2.3 PIPING SPECIALTIES:

- A. Pipe Line Strainers: UL-listed, 175 psi working pressure, Y-type or basket type, with ends to suit piping connections.

2.4 METERS:

- A. Detector-Type Meters: UL-listed, 175 psi working pressure, with disc meter bypass.

2.5 VALVES:

- A. Gate Valves: UL-listed, 175 psi working pressure for 12" and smaller, 150 psi for sizes larger than 12". Threaded, flanged, hub, or other end configurations to suit size of valve and piping connection. Inside screw type for use with indicator post, iron body bronze mounted, non-rising stem, solid wedge disc.
- B. Check Valves: UL-listed, 175 psi working pressure for 2" through 12", 150 psi for sizes larger than 12". Swing type, iron body bronze mounted with metal-to-metal or rubber-faced checks. Threaded, flanged, or hub end, to suit size and piping connections.

2.6 ACCESSORIES:

- A. Anchorages: Provide anchorages for tees, wyes, crosses, plugs, caps, bends, valves, and hydrants. After installation, apply full coat of asphalt or other acceptable corrosion-retarding material to surfaces of ferrous anchorages.
- B. Clamps, Straps, and Washers: Steel, ASTM A 506.
- C. Rods: Steel, ASTM A 575.
- D. Rod Couplings: Malleable-iron, ASTM A 197.
- E. Bolts: Steel, ASTM A 307.
- F. Cast-Iron Washers: Gray-iron, ASTM A 126.
- G. Thrust Blocks: Concrete, 2,500 psi.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Identification: During back-filling/top-soiling of underground fire water piping systems, install continuous underground-type plastic line marker, located directly over buried line at 6" to 8" below finished grade.
- B. Pipe and pipe fittings:
 - 1. Ductile-Iron Pipe: Install in accordance with AWWA C600 "Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances".
 - 2. PVC Pipe: Install in accordance with manufacturers recommendations and provide pipe bedding as required by authority having jurisdiction.
- C. Piping Specialties:
 - 1. Pipe Line Strainers: Install as indicated, with valved blowoff piped to drain.
- D. Meters: Install as indicated with shutoff valve on either side of meter and valved bypass full line size.

- E. Valves: Provide post indicator for control valves.
 - 1. Shutoff Valves: Install shutoff valve ahead of each hydrant.
- F. Runs shall be as close as possible to those shown on drawings.

3.2 FIELD QUALITY CONTROL:

- A. Testing Agency: The Owner will employ and pay a qualified independent testing agency to perform field quality-control testing services specified in this section. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.
- B. Piping Tests: Conduct piping tests before joints are covered, and after thrust blocks have sufficiently hardened. Fill pipeline with water 24-hrs prior to testing, and apply test pressure to stabilize system.
- C. Hydrostatic Tests: Test at not less than 200 psi for 2-hrs, or at 50 psi above maximum static pressure if it is greater than 150 psi.
 - 1. Test fails if leakage exceeds 2-qts per hour per 100 gaskets or joints irrespective of pipe diameter.
 - 2. Increase pressure in 50 psi increments and inspect each joint between increments. Hold at test pressure for one hour, decrease to 0 psi. Slowly increase again to test pressure and hold for one more hour.
- D. Operating Tests: Open and close all valves and hydrants under system water pressure. Check dry barrel hydrants for proper drainage.
 - 1. For systems with fire pumps, run pumps during operating tests.

3.3 ADJUSTING AND CLEANING:

- A. Flushing: Flush underground mains and lead-in connections to sprinkler risers before connection is made to sprinklers, standpipes, or other fire protection system piping.
 - 1. Flush at flow rate not less than that indicated in NFPA 24, or at hydraulically calculated water demand rate of the system, whichever is greater.
- B. Disinfection of Potable Water System: Flush pipe system with clean potable water until no dirty water appears at point of outlet. Fill system with water-chlorine solution containing at least 50 ppm of chlorine. Valve off system and let stand for 24- hrs minimum. Flush with clean potable water until no chlorine remains in water coming from system.
 - 1. Repeat procedure if contamination is present in bacteriological examination.
- C. Disinfection of Water Mains: Flush and disinfect in accordance with AWWA C652 "Standard for Disinfecting Water Mains".
 - 1. Contractor shall submit written verification to Project Manager stating, Disinfection has been completed in strict compliance with specification for this project and with jurisdiction having authority over water system

END OF SECTION 331119