

SECTION 211200 - FIRE-SUPPRESSION STANDPIPES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection specialty valves.
3. Hose connections.
4. Fire Department Cabinet
5. Alarm devices.
6. Pressure gauges.

B. Related Requirements:

1. Section 211119 "Fire Department Connections" for exposed-, flush-, and yard-type fire-department connections.
2. Section 211100 "Facility Fire-Suppression Water-Service Piping" for water-service piping; ductile-iron expansion joints and deflection fittings; tubular- and split-sleeve, pipe-coupling transition fittings; water meters; detector check valves; backflow preventers; and protective enclosures.
3. Section 211313 "Wet-Pipe Sprinkler Systems" for wet-pipe sprinkler piping.
4. Section 284621.11 "Addressable Fire-Alarm Systems" for connections to alarm devices.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fire-suppression standpipes.

1. Include plans, elevations, sections, and attachment details.
2. Include diagrams for power, signal, and control wiring.

C. Delegated-Design Submittal: For standpipe systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Floor plans, sections, and other details, drawn to scale, or BIM model, showing the items described in this Section and coordinated with all building trades.

B. Approved Standpipe Drawings: Working plans, prepared in accordance with NFPA 14, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

- C. Welding certificates.
- D. Fire-hydrant flow test report.
- E. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 14. Include "Contractor's Material and Test Certificate for Aboveground Piping" and "Contractor's Material and Test Certificate for Underground Piping."
- F. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's responsibilities include designing, fabricating, and installing fire-suppression standpipes and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
 - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.
 - B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTIONS

- A. Automatic Wet-Type, Class I Standpipe System: Includes NPS 2-1/2 (DN 65) hose connections, has open water-supply valve with pressure maintained, and is capable of supplying water demand.

2.2 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NFPA Standards: Fire-suppression standpipe equipment, specialties, accessories, installation, and testing shall comply with NFPA 14.
- C. Standard-Pressure, Fire-Suppression Standpipe System Component: Listed for 175-psig (1200-kPa) minimum working pressure.

- D. Delegated Design: Design fire-suppression standpipes, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
 - 1. Available fire-hydrant flow test records indicate the following conditions:
 - a. Date:
 - b. Time:
 - c. Location of Residual Fire Hydrant R:
 - d. Location of Flow Fire Hydrant F:
 - e. Static Pressure at Residual Fire Hydrant R: **psig**
 - f. Measured Flow at Flow Fire Hydrant F: **500 gpm** .
 - g. Residual Pressure at Residual Fire Hydrant R: **psig**
- E. Fire-suppression standpipe design shall be approved by authorities having jurisdiction.
 - 1. Minimum residual pressure at each hose-connection outlet is as follows:
 - a. **NPS 2-1/2 (DN 65) Hose Connections: 100 psig (690 kPa).**
- F. Interruption of Existing Fire-Suppression Standpipe Service: Do not interrupt fire-suppression standpipe service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary fire-suppression standpipe service in accordance with requirements indicated:
 - 1. Notify Owner no fewer than two days in advance of proposed interruption of fire-suppression standpipe service.
 - 2. Do not proceed with interruption of fire-suppression standpipe service without Owner's written permission.

2.3 PIPING MATERIALS

- A. Comply with requirements in Part 3 "Piping Schedule" Article for applications of pipe, tube, and fitting materials and for joining methods for specific services, service locations, and pipe sizes.

2.4 BLACK STEEL PIPE AND ASSOCIATED FITTINGS

- A. Schedule 40: ASTM A53/A53M, Type E, Grade B ASTM A135/A135M, Grade A ASTM A795/A795M, Type E, Grade A, with factory- or field-formed ends to accommodate joining method.
- B. Uncoated, Steel Couplings: ASTM A865/A865M, threaded.
- C. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- D. Malleable- or Ductile-Iron Unions: UL 860.
- E. Cast-Iron Flanges: ASME B16.1, Class 125.
- F. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.

- G. Steel Welding Fittings: ASTM A234/A234M and ASME B16.9.
- H. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Pressure Rating: 175-psig (1200-kPa) minimum.
 - 2. Uncoated, Grooved-End Fittings for Steel Piping: ASTM A47/A47M malleable-iron casting or ASTM A536 ductile-iron casting, with dimensions matching steel pipe.
 - 3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213 rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.5 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: AWWA C110/A21.10, rubber, flat face, 1/8 inch (3.2 mm) thick or ASME B16.21, nonmetallic and asbestos free.
 - 1. Class 125, Cast-Iron Flanges and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1 carbon steel unless otherwise indicated.
- C. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.6 SPECIALTY VALVES

- A. General Requirements:
 - 1. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
 - 2. Pressure Rating:
 - a. Standard-Pressure Piping Specialty Valves: 175-psig (1200-kPa) minimum.
 - 3. Body Material: Cast or ductile iron.
 - 4. Size: Same as connected piping.
 - 5. End Connections: Flanged or grooved.
- B. Alarm Valves:
 - 1. Standard: UL 193.
 - 2. Design: For horizontal or vertical installation.
 - 3. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gauges, retarding chamber, and fill-line attachment with strainer.
 - 4. Drip Cup Assembly: Pipe drain without valves and separate from main drain piping.
- C. Automatic (Ball Drip) Drain Valves:
 - 1. Standard: UL 1726.
 - 2. Pressure Rating: 175-psig (1200-kPa) minimum.
 - 3. Type: Automatic draining, ball check.
 - 4. Size: NPS 3/4 (DN 20).
 - 5. End Connections: Threaded.

2.7 HOSE CONNECTIONS

- A. Nonadjustable-Valve Hose Connections:
1. Standard: UL 668 hose valve for connecting fire hose.
 2. Pressure Rating: 300-psig (2070-kPa) minimum.
 3. Material: Brass or bronze.
 4. Size: NPS 2-1/2 (DN 65), as indicated.
 5. Inlet: Female pipe threads.
 6. Outlet: Male hose threads with lugged cap, gasket, and chain. Include hose valve threads in accordance with NFPA 1963 and matching local fire-department threads.
 7. Pattern: Angle] or gate.
 8. Finish: Rough brass or bronze.

2.8 FIRE DEPARTMENT CABINET

- A. Applicable Code Section: NYC BC 905.3
- B. Description: Fire Department cabinet shall be provided for a combination standpipe class I with sprinkler system.
- C. Location: Cabinets shall be located at the main floor and every ten stories after. Each cabinet must be within 15 ft (4.5 m) from the standpipe riser.
- D. The cabinet shall contain the following contents:
1. One fog nozzle
 2. One 1-1/2 inch (38 mm) spanner wrench
 3. One 2-1/2 inch (64 mm) spanner wrench
 4. One 2-1/2 inch (64 mm) x 1-1/2 inch (38 mm) non-swivel reducing coupling
 5. One 1-1/2 inch (38 mm) diameter hose, 125 ft (38 m) long
- Note: For systems with more than two standpipe risers, at least two of each item must be provided.
- E. Signage:
1. The cabinets shall be labeled "FOR FIRE DEPARTMENT USE ONLY."
 2. A metal sign indicating the location of the Fire Department Cabinet shall be placed on each stair enclosure of the floor where the cabinets are located.
- F. Cabinets shall be kept locked and only openable by a Fire Department citywide standard key.
- G. The cabinets shall be constructed of fire rated materials.

2.9 ALARM DEVICES

- A. Match alarm-device material and connection types to piping and equipment materials and connection types.
- B. Electrically Operated Alarm Bell:
1. Standard: UL 464.
 2. Type: Vibrating, metal alarm bell.

3. Size: 10-inch (250-mm) diameter.
 4. Finish: Red-enamel factory finish, suitable for outdoor use.
- C. Water-Flow Indicators:
1. Standard: UL 346.
 2. Water-Flow Detector: Electrically supervised.
 3. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
 4. Type: Paddle operated.
 5. Pressure Rating: 250 psig (1725 kPa).
 6. Design Installation: Horizontal or vertical.
- D. Valve Supervisory Switches:
1. Standard: UL 346.
 2. Type: Electrically supervised.
 3. Components: Single-pole, double-throw switch with normally closed contacts.
 4. Design: Signals that controlled valve is in other than fully open position.

2.10 PRESSURE GAUGES

- A. Standard: UL 393.
- B. Dial Size: 3-1/2- to 4-1/2-inch (90- to 115-mm) diameter.
- C. Pressure Gauge Range: Zero to 300 psig (Zero to 2070 kPa).
- D. Water System Piping Gauge: Include "WATER" label on dial face.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 14 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

3.2 SERVICE-ENTRANCE PIPING

- A. Connect fire-suppression standpipe piping to water-service piping at service entrance into building. Comply with requirements for exterior piping in Section 211100 "Facility Fire-Suppression Water-Service Piping."
- B. Install shutoff valve, backflow preventer, pressure gauge, drain, and other accessories at connection to fire-suppression water-service piping. Comply with requirements for backflow preventers in Section 211100 "Facility Fire-Suppression Water-Service Piping."

- C. Install shutoff valve, check valve, pressure gauge, and drain at connection to water service.

3.3 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
 - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements in NFPA 14 for installation of fire-suppression standpipe piping.
- C. Install listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- D. Install drain valves on standpipes. Extend drain piping to main sewer lines at the lowest level of the building.
- E. Install automatic (ball drip) drain valves to drain piping between fire-department connections and check valves. Drain to floor drain or outside building.
- F. Install alarm devices in piping systems.
- G. Install hangers and supports for standpipe system piping in accordance with NFPA 14. Comply with requirements in NFPA 13 for hanger materials.
- H. Install pressure gauges on riser or feed main and at top of each standpipe. Include pressure gauges with connection of not less than **NPS 1/4 (DN 8)** and with soft-metal seated globe valve, arranged for draining pipe between gauge and valve. Install gauges to permit removal and install where they are not subject to freezing.
- I. Fill wet-type standpipe system piping with water.
- J. Install electric heating cables and pipe insulation on wet-type fire-suppression standpipe piping in areas subject to freezing. Comply with requirements for heating cables in Section 210533 "Heat Tracing for Fire-Suppression Piping" and for piping insulation in Section 210700 "Fire-Suppression Systems Insulation."
- K. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- L. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."

3.4 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes **NPS 2 (DN 50)** and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having **NPS 2-1/2 (DN 65)** and larger end connections.
- D. Ream ends of pipes and tubes, and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts in accordance with ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads in accordance with ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe in accordance with AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings in accordance with AWWA C606 for steel-pipe grooved joints.
- I. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
 - 1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.
- J. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.5 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties in accordance with NFPA 14, authorities having jurisdiction and manufacturer's instructions.
- B. Install listed fire-protection supervised-open shutoff valves, located to control sources of water supply, except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.

- C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.
- D. Specialty Valves:
 - 1. General Requirements: Install in vertical position for proper direction of flow, in main supply to system.
 - 2. Alarm Valves: Install bypass check valve and retarding chamber drain-line connection.

3.6 HOSE-CONNECTION INSTALLATION

- A. Install hose connections adjacent to standpipes.
- B. Install freestanding hose connections for access and minimum passage restriction.
- C. Install **NPS 2-1/2 (DN 65)** hose connections .
- D. Install valves at angle required for connection of fire hose.

3.7 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping in accordance with NFPA 14 requirements.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect standpipe systems in accordance with NFPA 14, "System Acceptance" chapter as modified by New York City Building Code Appendix Q.
 - 4. Energize circuits to electrical equipment and devices.
 - 5. Coordinate with fire-alarm tests. Operate as required.
 - 6. Coordinate with fire-pump tests. Operate as required.
 - 7. Verify that equipment hose threads are same as local fire-department equipment.
- C. Fire-suppression standpipe system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.9 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain specialty valves.

3.10 PIPING SCHEDULE

- A. Piping between Fire-Department Connections and Check Valves: Galvanized, standard-weight steel pipe with grooved ends, grooved-end fittings, grooved-end-pipe couplings, and grooved joints.
- B. Standard-pressure, wet-type fire-suppression standpipe piping, **NPS 4 (DN 100)** and smaller, shall be the following:
 - 1. Schedule 40, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
 - 2. Schedule 40, black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 - 3. Schedule 40, black-steel pipe with plain ends; steel welding fittings; and welded joints.
- C. Standard-pressure, wet-type fire-suppression standpipe piping, **NPS 4 and larger (DN 125 and larger)**, shall be the following:
 - 1. Schedule 40, black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 - 2. Schedule 40, black-steel pipe with plain ends; steel welding fittings; and welded joints.

END OF SECTION 211200