Revisions made to the original MasterSpec text are made solely by the Licensee and are not endorsed by, or representative of the opinions of, Deltek or The American Institute of Architects (AIA). Neither AIA nor Deltek are liable in any way for such revisions or for the use of this Section by any end user. A qualified design professional should review and edit the document to suit project requirements.

SECTION 211200 - FIRE-SUPPRESSION STANDPIPES

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Hose connections.

Manual control stations.

Control panels.

* + - * 1. Related Requirements:

Retain subparagraphs below that contain requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 104413 "Fire Protection Cabinets" for hose-connection and hose-station cabinets.

Section 210523 "General-Duty Valves for Water-Based Fire-Suppression Piping."

Section 211119 "Fire Department Connections" for exposed-, flush-, and yard-type fire-department connections.

Section 211213 "Fire-Suppression Hoses and Nozzles" for rack-type hose stations, reel-type hose stations, and monitors.

Section 211313 "Wet-Pipe Sprinkler Systems" for wet-pipe sprinkler piping.

Section 211316 "Dry-Pipe Sprinkler Systems" for dry-pipe sprinkler piping.

[**Section 284621.11 "Addressable Fire-Alarm Systems"**] [**Section 284621.13 "Conventional Fire-Alarm Systems"**] for connections to alarm devices.

Section 331415 "Site Water Distribution 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.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project. Include only essential definitions or acronyms not well understood by the affected industry or trade.

Some fire-protection products for high-pressure sprinkler piping are only rated for 250 psig (1725 kPa). If 300-psig (2070-kPa) piping is required, verify product pressure ratings.

* + - * 1. High-Pressure Standpipe Piping: Fire-suppression standpipe piping designed to operate at working pressure of higher than standard 175 psig, but not higher than [**250 psig**] [**300 psig**].
        2. Standard-Pressure Standpipe Piping: Fire-suppression standpipe piping designed to operate at maximum working pressure of 175 psig.
      1. ACTION SUBMITTALS

Action submittals are submittals requiring responsive action and return of reviewed documents to Contractor.

* + - * 1. Product Data: For each product.[ **Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.**]
        2. Shop Drawings: For fire-suppression standpipes.

Include plans, elevations, sections, and attachment details.

Retain subparagraph below if equipment includes wiring.

Include diagrams for power, signal, and control wiring.

Retain "Delegated Design Submittals" Paragraph below if design services have been delegated to Contractor.

* + - * 1. Delegated Design Submittals: 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. INFORMATIONAL SUBMITTALS

Informational submittals are submittals that require review by Architect, but they do not require Architect's responsive action and return of reviewed documents to Contractor, provided submittals comply with requirements. If rejected, submittals with responsive action must be returned to Contractor.

Retain "Coordination Drawings" Paragraph below for situations where limited space necessitates maximum utilization for efficient installation of different components or if coordination is required for installation of products and materials by separate installers. Coordinate paragraph with other Sections specifying products listed below. Preparation of coordination drawings requires the participation of each trade involved in installations within the limited space.

* + - * 1. 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.

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer[ **and professional engineer**].

Retain "Approved Standpipe Drawings" Paragraph below if design by Contractor is specified in Part 2 "Performance Requirements" Article.

* + - * 1. Approved Standpipe Drawings: Working plans, prepared in accordance with NFPA 14, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

Retain "Welding certificates" Paragraph below if retaining "Welding Qualifications" Paragraph in "Quality Assurance" Article.

* + - * 1. Welding certificates.

Retain first paragraph below if report is specified in "Preparation" Article.

* + - * 1. Fire-hydrant flow test report.
        2. 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."
        3. Field quality-control reports.
      1. CLOSEOUT SUBMITTALS
         1. Operation and Maintenance Data: For fire-suppression standpipes specialties to include in emergency, operation, and maintenance manuals.
      2. QUALITY ASSURANCE

Retain "Installer Qualifications" Paragraph below if Contractor is required to assume responsibility for design of fire-suppression standpipes.

* + - * 1. Installer Qualifications:

Retain subparagraph below if Contractor is required to assume responsibility for engineering.

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.

Retain subparagraph below if Contractor is required to engage a qualified professional engineer.

Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.

Retain "Welding Qualifications" Paragraph below if shop or field welding is required. If retaining, also retain "Welding certificates" Paragraph in "Informational Submittals" Article.

* + - * 1. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

1. PRODUCTS
   * + 1. SYSTEM DESCRIPTIONS

Retain one or more of 11 paragraphs in this article. If using more than one standpipe or sprinkler system, identify each system on Drawings. Delete descriptions of systems not included in this Section.

* + - * 1. Automatic Wet-Type, Class I Standpipe System: Includes NPS 2-1/2 hose connections, has open water-supply valve with pressure maintained, and is capable of supplying water demand.
        2. Automatic Wet-Type, Class II Standpipe System: Includes NPS 1-1/2 hose stations, has open water-supply valve with pressure maintained, and is capable of supplying water demand.
        3. Automatic Wet-Type, Class III Standpipe System: Includes NPS 1-1/2 hose stations and NPS 2-1/2 hose connections, has open water-supply valve with pressure maintained, and is capable of supplying water demand.
        4. Automatic Dry-Type, Class I Standpipe System: Includes NPS 2-1/2 hose connections and has open water-supply valve and dry-pipe valve, with standpipes containing compressed air or nitrogen. Opening fire-hose valve releases compressed air and permits water pressure to open dry-pipe valve. Water then flows into standpipes.
        5. Automatic Dry-Type, Class II Standpipe System: Includes NPS 1-1/2 hose stations and has open water-supply valve and dry-pipe valve, with standpipes containing compressed air or nitrogen. Opening fire-hose valve releases compressed air and permits water pressure to open dry-pipe valve. Water then flows into standpipes.
        6. Automatic Dry-Type, Class III Standpipe System: Includes NPS 1-1/2 hose stations and NPS 2-1/2 hose connections and has open water-supply valve and dry-pipe valve, with standpipes containing compressed air or nitrogen. Opening fire-hose valve releases compressed air and permits water pressure to open dry-pipe valve. Water then flows into standpipes.
        7. Semiautomatic Dry-Type, Class I Standpipe System: Includes NPS 2-1/2 hose connections and has open water-supply valve and deluge valve, with standpipes containing air. Actuation of detection device permits water pressure to open deluge valve. Water then flows into standpipes.
        8. Semiautomatic Dry-Type, Class II Standpipe System: Includes NPS 1-1/2 hose stations and has open water-supply valve and deluge valve, with standpipes containing air. Actuation of detection device permits water pressure to open deluge valve. Water then flows into standpipes.
        9. Semiautomatic Dry-Type, Class III Standpipe System: Includes NPS 1-1/2 hose stations and NPS 2-1/2 hose connections and has open water-supply valve and deluge valve, with standpipes containing air. Actuation of detection device permits water pressure to open deluge valve. Water then flows into standpipes.
        10. Manual Wet-Type, Class I Standpipe System: Includes NPS 2-1/2 hose connections and has small water supply to maintain water in standpipes. Piping is wet, but water must be pumped into standpipes to satisfy demand.
        11. Manual Dry-Type, Class I Standpipe System: Includes NPS 2-1/2 hose connections, but does not have permanent water supply. Piping is dry. Water must be pumped into standpipes to satisfy demand.
      1. PERFORMANCE REQUIREMENTS
         1. 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.
         2. NFPA Standards: Fire-suppression standpipe equipment, specialties, accessories, installation, and testing to comply with NFPA 14.
         3. Standard-Pressure, Fire-Suppression Standpipe System Component: Listed for 175-psig minimum working pressure.
         4. High-Pressure, Fire-Suppression Standpipe System Component: Listed for [**250-psig** **minimum**] [**300-psig**] [**350-psig**] working pressure.

Retain "Delegated Design" Paragraph below if Contractor is required to assume responsibility for design.

* + - * 1. Delegated Design: Design fire-suppression standpipes, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

Retain data in subparagraph below if known and if Owner wants to furnish test data to Contractor.

Available fire-hydrant flow test records indicate the following conditions:

Date: <**Insert test date**>.

Time: <**Insert time**> [**a.m.**] [**p.m.**]

Performed by: <**Insert operator's name**> of <**Insert firm**>.

Location of Residual Fire Hydrant R: <**Insert location**>.

Location of Flow Fire Hydrant F: <**Insert location**>.

Static Pressure at Residual Fire Hydrant R: <**Insert psig**>.

Measured Flow at Flow Fire Hydrant F: <**Insert gpm**>.

Residual Pressure at Residual Fire Hydrant R: <**Insert psig**>.

Retain first two paragraphs below if system design has not been approved by authorities having jurisdiction.

* + - * 1. Fire-suppression standpipe design to be approved by authorities having jurisdiction.

Minimum residual pressure at each hose-connection outlet is as follows:

NPS 1-1/2 (DN 40) Hose Connections: [**65 psig**] <**Insert value**>.

NPS 2-1/2 (DN 65) Hose Connections: [**65 psig**] [**100 psig**] <**Insert value**>.

Coordinate "Seismic Performance" Paragraph below with Section 210548 "Vibration and Seismic Controls for Fire-Suppression Piping and Equipment."

* + - * 1. Seismic Performance: Fire-suppression standpipes to withstand the effects of earthquake motions determined in accordance with NFPA 13 and [**ASCE/SEI 7**] <**Insert requirement**>. See Section 210548 "Vibration and Seismic Controls for Fire-Suppression Piping and Equipment."

Retain paragraph below if interruption of existing water-based, fire-suppression standpipe service is required.

* + - * 1. 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:

Notify [**Architect**] [**Construction Manager**] [**Owner**] no fewer than [**two**] <**Insert number**> days in advance of proposed interruption of fire-suppression standpipe service.

Do not proceed with interruption of fire-suppression standpipe service without [**Architect's**] [**Construction Manager's**] [**Owner's**] written permission.

* + - 1. PIPING MATERIALS

See "Writing Guide" Article in the Evaluations for a discussion on this Section's organization and the most efficient way to revise this Section. See "Piping Materials and Standards" Article in the Evaluations for a discussion on availability of piping materials covered by referenced standards in corresponding pipe sizes.

* + - * 1. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials and for joining methods for specific services, service locations, and pipe sizes.
      1. PIPING JOINING MATERIALS
         1. Pipe-Flange Gasket Materials: [**AWWA C110/A21.10, rubber, flat face, 1/8 inch** **thick**] [**or**] [**ASME B16.21, nonmetallic and asbestos free**].

Class 125, Cast-Iron Flanges and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.

Class 250, Cast-Iron Flanges and Class 300, Steel Raised-Face Flanges: Ring-type gaskets.

* + - * 1. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1 carbon steel unless otherwise indicated.
        2. Brazing Filler Metals: AWS A5.8M/A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.
        3. 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.
      1. HOSE CONNECTIONS

Coordinate cabinets with Section 104413 "Fire Protection Cabinets." Indicate size and design outlet pressure setting on Drawings for each hose connection.

* + - * 1. Adjustable-Valve Hose Connections:

Retain "Basis-of-Design Product" Subparagraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

Basis-of-Design Product: Subject to compliance with requirements, provide **Zurn Industries, LLC; Model Z3000** or comparable product by one of the following:

<**Insert manufacturer's name**>

Standard: UL 668 hose valve, with integral UL 1468 reducing or restricting pressure-control device, for connecting fire hose.

Pressure Rating: 300-psig minimum.

Material: Brass or bronze.

Size: NPS 1-1/2 or NPS 2-1/2, as indicated.

Inlet: Female pipe threads.

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.

Pattern: [**Angle**] [**or**] [**gate**].

Pressure-Control Device Type: Pressure **[reducing]**.

Design Outlet Pressure Setting: <**Insert psig**>.

Finish: [**Polished chrome plated**] [**Rough brass or bronze**] [**Rough chrome plated**].

* + - 1. MANUAL CONTROL STATIONS

Retain this article for dry-type standpipe system piping; delete if using "Control Panels" Article or if control stations are specified in Section 284621.11 "Addressable Fire-Alarm Systems" and Section 284621.13 "Conventional Fire-Alarm Systems."

* + - * 1. Description: UL listed or FM Global approved, hydraulic operation, with union, NPS 1/2 pipe nipple, and bronze ball valve. Include metal enclosure, labeled "MANUAL CONTROL STATION," with operating instructions and cover held closed by breakable strut to prevent accidental opening.
      1. CONTROL PANELS

Retain this article for dry-type standpipe system piping; delete if using "Manual Control Stations" Article or if controls are specified in Section 284621.11 "Addressable Fire-Alarm Systems" and Section 284621.13 "Conventional Fire-Alarm Systems."

* + - * 1. Description: Single-area, two-area, or single-area cross-zoned control panel as indicated, including NEMA ICS 6, Type 1 enclosure, detector, alarm, and solenoid-valve circuitry for operation of deluge valves. Panels contain power supply; battery charger; standby batteries; field-wiring terminal strip; electrically supervised solenoid valves and polarized fire-alarm bell; lamp test facility; single-pole, double-throw auxiliary alarm contacts; and rectifier.

Panels: UL listed and FM Global approved when used with thermal detectors and Class A detector circuit wiring. Electrical characteristics are 120-V ac, 60 Hz, with 24-V dc rechargeable batteries.

Retain "Manual Control Stations, Electric Operation" or "Manual Control Stations, Hydraulic Operation" Subparagraph below.

Manual Control Stations, Electric Operation: Metal enclosure, labeled "MANUAL CONTROL STATION," with operating instructions and cover held closed by breakable strut to prevent accidental opening.

Manual Control Stations, Hydraulic Operation: Provide union, NPS 1/2 pipe nipple, and bronze ball valve. Include metal enclosure, labeled "MANUAL CONTROL STATION," with operating instructions and cover held closed by breakable strut to prevent accidental opening.

1. EXECUTION
   * + 1. PREPARATION

Retain this article if fire-hydrant flow test is required or if Owner has not provided flow information.

* + - * 1. Perform fire-hydrant flow test according to NFPA 14 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
        2. Report test results promptly and in writing.
      1. EXAMINATION
         1. Examine roughing-in for hose connections and stations to verify actual locations of piping connections before installation.
         2. Examine walls and partitions for suitable thickness, fire- and smoke-rated construction, framing for hose-station cabinets, and other conditions where hose connections and stations are to be installed.
         3. Proceed with installation only after unsatisfactory conditions have been corrected.
      2. SERVICE-ENTRANCE PIPING

Retain this article and delete "Water-Supply Connections" Article if connection to building's water-service piping is required.

* + - * 1. Connect fire-suppression standpipe piping to water-service piping at service entrance into building. Comply with requirements for exterior piping in Section 331415 "Site Water Distribution Piping."

Retain one of two paragraphs below. Backflow preventers are recommended and are usually required by authorities having jurisdiction. Do not specify backflow preventers here if they are specified in Section 331415 "Site Water Distribution Piping."

* + - * 1. 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 331415 "Site Water Distribution Piping."**]
        2. Install shutoff valve, check valve, pressure gauge, and drain at connection to water service.
      1. WATER-SUPPLY CONNECTIONS

Retain this article and delete "Service-Entrance Piping" Article if connection to building's water-distribution piping is required.

* + - * 1. Connect fire-suppression standpipe piping to building's interior water-distribution piping. Comply with requirements for interior piping in Section 221116 "Domestic Water Piping."

Retain one of two paragraphs below. Backflow preventers are recommended and are usually required by authorities having jurisdiction.

* + - * 1. Install shutoff valve,[ **backflow preventer,**] pressure gauge, drain, and other accessories at connection to water-distribution piping.[ **Comply with requirements for backflow preventers in Section 331415 "Site Water Distribution Piping."**]
        2. Install shutoff valve, check valve, pressure gauge, and drain at connection to water supply.
      1. INSTALLATION OF PIPING
         1. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.

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.

* + - * 1. Piping Standard: Comply with requirements in NFPA 14 for installation of fire-suppression standpipe piping.

Retain first paragraph below if piping is required to withstand seismic design loads.

* + - * 1. Install seismic restraints on piping. Comply with requirements in NFPA 13 for seismic-restraint device materials and installation.
        2. Install listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
        3. Install drain valves on standpipes. Extend drain piping to outside of building.
        4. Install automatic (ball drip) drain valves to drain piping between fire-department connections and check valves. Drain to floor drain or outside building.
        5. Install alarm devices in piping systems.
        6. Install hangers and supports for standpipe system piping in accordance with NFPA 14. Comply with requirements in NFPA 13 for hanger materials.
        7. 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 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.
        8. Drain dry-type standpipe system piping.
        9. Pressurize and check dry-type standpipe system piping and [**air-pressure maintenance devices**] [**air compressors**].
        10. Fill wet-type standpipe system piping with water.
        11. 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."

Retain one of first two paragraphs below.

* + - * 1. Connect compressed-air or nitrogen supply to dry-pipe sprinkler piping.
        2. Connect air compressor to the following piping and wiring:

Pressure gauges and controls.

Electrical power system.

Fire-alarm devices, including low-pressure alarm.

* + - * 1. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 210500 "Common Work Results for Fire Suppression."

Retain first paragraph below for piping that penetrates an exterior concrete wall or concrete slab.

* + - * 1. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 210500 "Common Work Results for Fire Suppression."
        2. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 210500 "Common Work Results for Fire Suppression."
      1. JOINT CONSTRUCTION
         1. 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.
         2. Install unions adjacent to each valve in pipes NPS 2 and smaller.
         3. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
         4. Ream ends of pipes and tubes, and remove burrs. Bevel plain ends of steel pipe.
         5. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
         6. 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.
         7. 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:

Apply appropriate tape or thread compound to external pipe threads.

Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.

* + - * 1. Steel-Piping, Cut-Grooved Joints: Cut square-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 joints.
        2. 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.
        3. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.

Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.

* + - * 1. Brazed Joints: Join copper tube and fittings according to Copper Development Association's "Copper Tube Handbook," "Brazed Joints" chapter.
        2. Copper-Tubing Grooved Joints: Roll rounded-edge groove in end of tube in accordance with AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join copper tube and grooved-end fittings in accordance with AWWA C606 for steel-pipe grooved joints.
        3. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.
      1. INSTALLATION OF VALVES AND SPECIALTIES
         1. 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.
         2. 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.
         3. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.
         4. Specialty Valves:

General Requirements: Install in vertical position for proper direction of flow, in main supply to system.

Alarm Valves: Install bypass check valve and retarding chamber drain-line connection.

[**Dry-Pipe**] [**and**] [**Deluge**] Valves: Install trim sets for air supply, drain, priming level, alarm connections, ball drip valves, pressure gauges, priming chamber attachment, and fill-line attachment.

Retain first subparagraph or second and third subparagraphs below.

Install air compressor and compressed-air-supply piping.

Air-Pressure Maintenance Device: Install shutoff valves to permit servicing without shutting down sprinkler system; bypass valve for quick system filling; pressure regulator or switch to maintain system pressure; strainer; pressure ratings with [**14- to 60-psig**] <**Insert value**> adjustable range; and [**175-psig**] <**Insert value**> maximum inlet pressure.

Install compressed-air-supply piping from building's compressed-air piping system.

* + - 1. INSTALLATION OF HOSE CONNECTIONS

Indicate hose-connection locations, sizes, and special devices on Drawings.

* + - * 1. Install hose connections adjacent to standpipes.
        2. Install freestanding hose connections for access and minimum passage restriction.
        3. Install NPS 1-1/2 hose-connection valves with flow-restricting device.
        4. Install NPS 2-1/2 hose connections with quick-disconnect NPS 2-1/2 by NPS 1-1/2 reducer adapter and flow-restricting device.
        5. Install wall-mounted-type hose connections in cabinets. Include pipe escutcheons, with finish matching valves, inside cabinet where water-supply piping penetrates cabinet. Install valves at angle required for connection of fire hose. Comply with requirements for cabinets in Section 104413 "Fire Protection Cabinets."
      1. INSTALLATION OF HOSE STATIONS

Indicate hose-station locations, sizes, and special devices on Drawings.

* + - * 1. Install freestanding hose stations for access and minimum passage restriction.
        2. Install NPS 1-1/2 hose-station valves with flow-restricting device unless otherwise indicated.
        3. Install NPS 2-1/2 hose connections with quick-disconnect NPS 2-1/2 by NPS 1-1/2 reducer adapter and flow-restricting device unless otherwise indicated.
        4. Install freestanding hose stations with support or bracket attached to standpipe.
        5. Install wall-mounted, rack hose stations in cabinets. Include pipe escutcheons, with finish matching valves, inside cabinet where water-supply piping penetrates cabinet. Install valves at angle required for connection of fire hose. Comply with requirements for cabinets in Section 104413 "Fire Protection Cabinets."
        6. Install hose-reel hose stations on wall with bracket.
      1. IDENTIFICATION
         1. Install labeling and pipe markers on equipment and piping in accordance with NFPA 14 requirements.
         2. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
      2. FIELD QUALITY CONTROL
         1. Perform tests and inspections.

Retain "Tests and Inspections" Paragraph below to describe tests and inspections to be performed.

* + - * 1. Tests and Inspections:

Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.

Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

Flush, test, and inspect standpipe systems in accordance with NFPA 14, "System Acceptance" chapter.

Energize circuits to electrical equipment and devices.

Start and run air compressors.

Coordinate with fire-alarm tests. Operate as required.

Coordinate with fire-pump tests. Operate as required.

Verify that equipment hose threads are same as local fire-department equipment.

See Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.

* + - * 1. Fire-suppression standpipe system will be considered defective if it does not pass tests and inspections.
        2. Prepare test and inspection reports.
      1. DEMONSTRATION
         1. [**Engage a factory-authorized service representative to train**] [**Train**] Owner's maintenance personnel to adjust, operate, and maintain specialty valves.
      2. PIPING SCHEDULE

Retain piping applications in this article. Coordinate with materials specified in Part 2.

* + - * 1. Piping between Fire-Department Connections and Check Valves: Galvanized, standard-weight steel pipe with [**threaded ends, cast-iron threaded fittings, and threaded**] [**grooved ends, grooved-end fittings, grooved-end-pipe couplings, and grooved**] joints.

Retain "one of" option in first paragraph below to allow Contractor to select piping materials from those retained.

* + - * 1. Standard-pressure, wet-type fire-suppression standpipe piping, [**NPS 4** **and smaller**] <**Insert pipe size range**>, to be[ **one of**] the following:

Retain one or more of nine subparagraphs below. If using more than one type of material and joining method, identify various materials on Drawings, and show points of transition from one material to another.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.

[**Schedule 40**] [**Schedule 30**] [**or**] [**thinwall**], galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with [**cut-**] [**or**] [**roll-**]grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Schedule 40**] [**or**] [**Schedule 30**], galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with plain ends; steel welding fittings; and welded joints.

[**Thinwall**] [**Schedule 10**] [**or**] [**lightwall**], black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Thinwall**] [**Schedule 10**] [**or**] [**lightwall**], black-steel pipe with plain ends; welding fittings; and welded joints.

[**Type L**] [**Type M**], hard copper tube with plain ends; [**cast-**] [**or**] [**wrought-**]copper solder-joint fittings; and brazed joints.

[**Type L**] [**Type M**], hard copper tube with roll-grooved ends; copper, grooved-end fittings; grooved-end-tube couplings; and grooved joints.

Retain "one of" option in first paragraph below to allow Contractor to select piping materials from those retained.

* + - * 1. Standard-pressure, wet-type fire-suppression standpipe piping, [**NPS 5 to NPS 8**] <**Insert pipe size range**>, to be[ **one of**] the following:

Retain one or more of seven subparagraphs below. If using more than one type of material and joining method, identify various materials on Drawings, and show points of transition from one material to another.

[**Schedule 40**] [**Schedule 30**] [**or**] [**thinwall**], black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with [**cut-**] [**or**] [**roll-**]grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with plain ends; steel welding fittings; and welded joints.

[**Thinwall**] [**Schedule 10**] [**or**] [**lightwall**], black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Thinwall**] [**Schedule 10**] [**or**] [**lightwall**], black-steel pipe with plain ends; welding fittings; and welded joints.

[**Type L**] [**Type M**], hard copper tube with plain ends; [**cast-**] [**or**] [**wrought-**]copper solder-joint fittings; and brazed joints.

[**Type L**] [**Type M**], hard copper tube with roll-grooved ends; copper, grooved-end fittings; grooved-end-tube couplings; and grooved joints.

Retain "one of" option in first paragraph below to allow Contractor to select piping materials from those retained.

* + - * 1. Standard-pressure, wet-type fire-suppression standpipe piping, [**NPS 10 and NPS 12**] <**Insert pipe size range**>, to be[ **one of**] the following:

Retain one or more of four subparagraphs below. If using more than one type of material and joining method, identify various materials on Drawings, and show points of transition from one material to another.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with [**cut-**] [**or**] [**roll-**]grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with plain ends; steel welding fittings; and welded joints.

[**Thinwall**] [**Schedule 10**] [**or**] [**lightwall**], black-steel pipe with plain ends; welding fittings; and welded joints.

Retain "one of" option in first paragraph below to allow Contractor to select piping materials from those retained.

* + - * 1. High-pressure, wet-type fire-suppression standpipe piping, [**NPS 4** **and smaller**] <**Insert pipe size range**>, to be[ **one of**] the following:

Retain one or more of four subparagraphs below. If using more than one type of material and joining method, identify various materials on Drawings, and show points of transition from one material to another.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with [**cut**] [**cut- or roll**] [**roll**]-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with plain ends; steel welding fittings; and welded joints.

[**Thinwall**] [**Schedule 10**] [**or**] [**lightwall**], black-steel pipe with plain ends; welding fittings; and welded joints.

Retain "one of" option in first paragraph below to allow Contractor to select piping materials from those retained.

* + - * 1. High-pressure, wet-type fire-suppression standpipe piping, [**NPS 5** **and larger**] <**Insert pipe size range**>, to be[ **one of**] the following:

Retain one or more of four subparagraphs below. If using more than one type of material and joining method, identify various materials on Drawings, and show points of transition from one material to another.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with [**cut-**] [**or**] [**roll-**]grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

[**Schedule 40**] [**or**] [**Schedule 30**], black-steel pipe with plain ends; steel welding fittings; and welded joints.

[**Thinwall**] [**Schedule 10**] [**or**] [**lightwall**], black-steel pipe with plain ends; welding fittings; and welded joints.

Retain "one of" option in first paragraph below to allow Contractor to select piping materials from those retained.

* + - * 1. Standard-pressure, dry-type fire-suppression standpipe piping, [**NPS 4** **and smaller**] <**Insert pipe size range**>, to be[ **one of**] the following:

Retain one or more of two subparagraphs below. If using more than one type of material and joining method, identify various materials on Drawings, and show points of transition from one material to another.

[**Type L**] [**Type M**], hard copper tube with plain ends; [**cast-**] [**or**] [**wrought-**]copper solder-joint fittings; and brazed joints.

[**Type L**] [**Type M**], hard copper tube with roll-grooved ends; copper, grooved-end fittings; grooved-end-tube couplings; and grooved joints.

Retain "one of" option in paragraph below to allow Contractor to select piping materials from those retained.

* + - * 1. Standard-pressure, dry-type fire-suppression standpipe piping, [**NPS 5 and NPS 6**] <**Insert pipe size range**>, to be[ **one of**] the following:

Retain one or more of two subparagraphs below. If using more than one type of material and joining method, identify various materials on Drawings, and show points of transition from one material to another.

[**Type L**] [**Type M**], hard copper tube with plain ends; [**cast-**] [**or**] [**wrought-**]copper solder-joint fittings; and brazed joints.

[**Type L**] [**Type M**], hard copper tube with roll-grooved ends; copper, grooved-end fittings; grooved-end-tube couplings; and grooved joints.

END OF SECTION 211200