

## SECTION 211200 - FIRE-SUPPRESSION STANDPIPES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

A. Section Includes:

1. Fire-protection valves.
2. Hose connections.
3. Fire-department connections.
4. Alarm devices.
5. Pressure gages.

B. Related Sections:

1. Division 21 Section "Wet-Pipe Sprinkler Systems" for wet-pipe sprinkler piping.
2. Division 21 Section "Electric-Drive, Centrifugal Fire Pumps" for fire pumps, pressure-maintenance pumps, and fire-pump controllers.

#### 1.3 DEFINITIONS

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.

- A. High-Pressure Standpipe Piping: Fire-suppression standpipe piping designed to operate at working pressure higher than standard 175 psig (1200 kPa), but not higher than 250 psig (1725 kPa).
- B. Standard-Pressure Standpipe Piping: Fire-suppression standpipe piping designed to operate at working pressure 175 psig (1200 kPa) maximum.

#### 1.4 SYSTEM DESCRIPTIONS

Retain one or more of paragraphs in this article. Combined sprinkler / standpipe system is commonly used. Consult MSU Planning, Design and Construction, and Fire Marshall.

- 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.

- B. Automatic Dry-Type, Class I Standpipe System: Includes NPS 2-1/2 (DN 65) hose connections. Has open water-supply valve and dry-pipe valve with standpipes containing compressed air. Opening fire-hose valve releases compressed air and permits water pressure to open dry-pipe valve. Water then flows into standpipes.
- C. Combined Sprinkler / Standpipe System: A standpipe system having piping that supplies both hose connections and automatic sprinklers.

## 1.5 PERFORMANCE REQUIREMENTS

- A. Standard-Pressure, Fire-Suppression Standpipe System Component: Listed for 175-psig (1200-kPa) minimum working pressure.
- B. Delegated Design: Design fire-suppression standpipes for Class I service per NFPA 14 using performance requirements and design criteria indicated.
- C. Fire-suppression standpipe design shall be approved by authorities having jurisdiction.
  - 1. Minimum residual pressure at most remote 2-1/2" hose-connection outlet is as follows:
    - a. 65 psig (450 kPa) for non-classroom facilities.
    - b. 100 psig (690 kPa) for classroom facilities.
  - 2. Maximum residual pressure at required flow at each hose-connection outlet is as follows unless otherwise indicated:
    - a. NPS 2-1/2 (DN 65) Hose Connections: 175 psig (1200 kPa).

## 1.6 SUBMITTALS

- A. Review Procedure for Projects involving with classrooms:
  - 1. Contractor shall submit the shop drawings, working plans including product data and hydraulic calculations where applicable, to the Factory Mutual (FM) Global and Architect/Engineer (A/E) for their review, and to MSU Fire Marshall and IPF Planning, Design and Construction (PDC) for their record. Review shall be based on applicable NFPA Standards, current version or as specified in the construction document.
  - 2. FM Global shall provide review comments back to the A/E, MSU Fire Marshall and PDC.
  - 3. A/E shall consult with MSU PDC prior to applying comments from the FM Global, and return the shop drawings with review comments back to the Contractor. Repeat the process until the A/E approves the submittals.
  - 4. Contractor shall submit the A/E approved shop drawings to the State of Michigan Office of Fire Safety for final approval prior to installation.

Retain either paragraph above or below.

- B. Review Procedure for Projects not involving with classrooms:

1. Contractor shall submit the shop drawings, working plans including product data and hydraulic calculations where applicable, to the Factory Mutual Global (FMG) and Architect/Engineer (A/E) for their review, and to MSU Fire Marshall and IPF Planning, Design and Construction (PDC) for their record. Review shall be based on applicable NFPA Standards, current version or as specified in the construction document.
  2. FM Global shall provide review comments back to the A/E, MSU Fire Marshall and PDC.
  3. A/E shall consult with MSU PDC prior to applying comments from the FM Global, and return the shop drawings with review comments back to the Contractor. Repeat the process until the A/E approves the submittals.
  4. Contractor shall submit the A/E approved shop drawings to MSU Fire Marshal thru Project Representative for final approval prior to installation.
- C. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- D. Shop Drawings: For fire-suppression standpipes. Include plans, elevations, sections, details, and attachments to other work.

Retain subparagraph below if equipment includes wiring.

1. Wiring Diagrams: For power, signal, and control wiring.

- E. Approved Standpipe Drawings: Working plans, prepared according to NFPA 14, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

Retain first paragraph below if retaining procedures for welder certification in "Quality Assurance" Article.

- F. Welding certificates.

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

- G. Fire-hydrant flow test report.
- H. 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."
- I. Field quality-control reports.
- J. Operation and Maintenance Data: For fire-suppression standpipes specialties to include in emergency, operation, and maintenance manuals.

#### 1.7 QUALITY ASSURANCE

Retain first paragraph below if Contractor is required to assume responsibility for design of fire-suppression standpipes.

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.

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

- B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. 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.
- D. NFPA Standards: Fire-suppression standpipe equipment, specialties, accessories, installation, and testing shall comply with NFPA 14, "Installation of Standpipe and Hose Systems."

## 1.8 PROJECT CONDITIONS

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

- A. 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 according to 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.

## PART 2 - PRODUCTS

### 2.1 PIPING MATERIALS

- A. 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.

### 2.2 STEEL PIPE AND FITTINGS

All steel piping in this article is suitable for 175-psig (1200-kPa) minimum working pressure. Pipe in first paragraph below is intended for use with flanged, cut- or roll-grooved, plain-end-pipe, threaded, and welded joints. Pipe is available in NPS 1/8 to NPS 26 (DN 6 to DN 650). Use only black-steel pipe for roll-grooved and welded joints. Match options for fitting and pipe finish.

- A. Standard Weight, Galvanized- and Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.

Nipples in first paragraph below are available in NPS 1/8 to NPS 12 (DN 6 to DN 300).

- B. Standard-Weight, Galvanized- and Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, seamless steel pipe with threaded ends.

Couplings in first paragraph below are available in NPS 1/8 to NPS 20 (DN 6 to DN 500).

- C. Galvanized, Steel Couplings: ASTM A 865, threaded.

Fittings in first paragraph below are available in NPS 1/4 to NPS 12 (DN 8 to DN 300).

- D. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

Unions in first paragraph below are available in NPS 1/4 to NPS 3 (DN 8 to DN 80), but NPFA limits them to NPS 2 (DN 50) and smaller.

- E. Malleable- or Ductile-Iron Unions: UL 860.

Flanges in first paragraph below are available in NPS 1 to NPS 96 (DN 25 to DN 2400).

- F. Cast-Iron Flanges: ASME B16.1, Class 125.

Flanges and fittings in first paragraph below are available in NPS 1/2 to NPS 24 (DN 15 to DN 600).

- G. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.

Fittings in first paragraph below are available in NPS 1/2 to NPS 48 (DN 15 to DN 1200).

- H. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.

- I. Grooved-Joint, Steel-Pipe Appurtenances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Shurjoint Piping Products.
  - b. Tyco Fire & Building Products LP.
  - c. Victaulic Company.
2. Pressure Rating: 175 psig (1200 kPa) minimum.
3. Galvanized, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.

AWWA C606 and UL 213 cover couplings in subparagraph below in NPS 3/4 to at least NPS 12 (DN 20 to at least DN 300).

4. 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.

### 2.3 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic and asbestos free.
  - 1. Class 125, Cast-Iron Flanges and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
  - 2. Class 250, Cast-Iron Flanges and Class 300, Steel Raised-Face Flanges: Ring-type 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.

### 2.4 LISTED FIRE-PROTECTION VALVES

- A. General Requirements:
  - 1. Valves shall be UL listed or FM approved.
  - 2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig (1200 kPa).
  - 3. Minimum Pressure Rating for High-Pressure Piping: 250 psig (1725 kPa).

Valves in first paragraph below are available in NPS 3 (DN 80) and smaller.

- B. Ball Valves:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Anvil International, Inc.
    - b. NIBCO.
    - c. Victaulic Company.
  - 2. Standard: UL 1091 except with ball instead of disc.
  - 3. Valves NPS 1-1/2 (DN 40) and Smaller: Bronze body with threaded ends.
  - 4. Valves NPS 2 and NPS 2-1/2 (DN 50 and DN 65): Bronze body with threaded ends or ductile-iron body with grooved ends.
  - 5. Valves NPS 3 (DN 80): Ductile-iron body with grooved ends.
- C. Butterfly Valves:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Anvil International, Inc.
    - b. Kennedy Valve; a division of McWane, Inc.
    - c. Milwaukee Valve Company.
    - d. NIBCO INC.
    - e. Shurjoint Piping Products.

- f. Tyco Fire & Building Products LP.
- g. Victaulic Company.
2. Standard: UL 1091.
3. Pressure Rating: 175 psig (1200 kPa).
4. Valves NPS 2 (DN 50) and Smaller: Bronze body with threaded ends.
5. Valves NPS 2-1/2 (DN 65) and Larger: Cast or ductile-iron body with flanged or grooved ends.

Valves in first paragraph below are available in NPS 2 (DN 50) and larger.

D. Check Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Anvil International, Inc.
  - b. Clow Valve Company; a division of McWane, Inc.
  - c. Crane Co.; Crane Valve Group; Crane Valves.
  - d. Crane Co.; Crane Valve Group; Jenkins Valves.
  - e. Crane Co.; Crane Valve Group; Stockham Division.
  - f. Fire-End & Croker Corporation.
  - g. Kennedy Valve; a division of McWane, Inc.
  - h. Milwaukee Valve Company.
  - i. Mueller Co.; Water Products Division.
  - j. NIBCO INC.
  - k. Potter Roemer.
  - l. Reliable Automatic Sprinkler Co., Inc.
  - m. Shurjoint Piping Products.
  - n. Tyco Fire & Building Products LP.
  - o. Victaulic Company.
  - p. Viking Corporation.
2. Standard: UL 312.
3. Pressure Rating: 250 psig (1725 kPa) minimum.
4. Type: Swing check.
5. Body Material: Cast iron.
6. End Connections: Flanged or grooved.

E. OS&Y Gate Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Clow Valve Company; a division of McWane, Inc.
  - b. Crane Co.; Crane Valve Group; Crane Valves.
  - c. Crane Co.; Crane Valve Group; Jenkins Valves.
  - d. Crane Co.; Crane Valve Group; Stockham Division.
  - e. Hammond Valve.

- f. Milwaukee Valve Company.
  - g. Mueller Co.; Water Products Division.
  - h. NIBCO INC.
  - i. Shurjoint Piping Products.
  - j. Tyco Fire & Building Products LP.
2. Standard: UL 262.
  3. Valves NPS 2 (DN 50) and Smaller: Bronze body with threaded ends, 175 psig (1200 kPa) minimum.
  4. Valves NPS 2-1/2 (DN 65) and Larger: Cast or ductile-iron body with flanged or grooved ends, 250 psig (1725 kPa) minimum.

Valves in first paragraph below are available in NPS 2 (DN 50) and larger.

F. Indicating-Type Butterfly Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Anvil International, Inc.
  - b. Kennedy Valve; a division of McWane, Inc.
  - c. Milwaukee Valve Company.
  - d. NIBCO INC.
  - e. Shurjoint Piping Products.
  - f. Tyco Fire & Building Products LP.
  - g. Victaulic Company.
2. Standard: UL 1091.
3. Pressure Rating: 175 psig (1200 kPa) minimum.
4. Valves NPS 2 (DN 50) and Smaller:
  - a. Valve Type: Ball or butterfly.
  - b. Body Material: Bronze.
  - c. End Connections: Threaded.
5. Valves NPS 2-1/2 (DN 65) and Larger:
  - a. Valve Type: Butterfly.
  - b. Body Material: Cast or ductile iron.
  - c. End Connections: Flanged, grooved, or wafer.
6. Valve Operation: Integral electrical, 115-V ac, prewired, two-circuit, supervisory switch indicating device.

Retain first paragraph below with "Indicator Posts" Paragraph below. Valves are available in NPS 2 (DN 50) and larger.

G. NRS Gate Valves:



1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Clow Valve Company; a division of McWane, Inc.
  - b. Crane Co.; Crane Valve Group; Stockham Division.
  - c. Kennedy Valve; a division of McWane, Inc.
  - d. Mueller Co.; Water Products Division.
  - e. NIBCO INC.
  - f. Tyco Fire & Building Products LP.
2. Standard: UL 262.
3. Pressure Rating: 250 psig (1725 kPa) minimum.
4. Body Material: Cast iron with indicator post flange.
5. Stem: Nonrising.
6. End Connections: Flanged or grooved.

Retain paragraph below with "NRS Gate Valves" Paragraph above.

H. Indicator Posts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Clow Valve Company; a division of McWane, Inc.
  - b. Crane Co.; Crane Valve Group; Stockham Division.
  - c. Kennedy Valve; a division of McWane, Inc.
  - d. Mueller Co.; Water Products Division.
  - e. NIBCO INC.
  - f. Tyco Fire & Building Products LP.
2. Standard: UL 789.
3. Type: Horizontal for wall mounting.
4. Body Material: Cast iron with extension rod and locking device.
5. Operation: Wrench.

## 2.5 TRIM AND DRAIN VALVES

Trim and drain valves are UL listed, are typically used as part of specialty control valve trim and drain piping, and are NPS 2 (DN 50) and smaller. Most of these valves are ball type, but there are also a few angle, butterfly, gate, and globe types listed. No UL standard exists for these valves.

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig (1200 kPa) minimum.

B. Ball Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Conbraco Industries, Inc.; Apollo Valves.
  - b. Fire-End & Croker Corporation.
  - c. Kennedy Valve; a division of McWane, Inc.
  - d. Milwaukee Valve Company.
  - e. NIBCO INC.
  - f. Potter Roemer.
  - g. Tyco Fire & Building Products LP.
  - h. Victaulic Company.

## 2.6 SPECIALTY VALVES

### A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating:
  - a. Standard-Pressure Piping Specialty Valves: 175 psig (1200 kPa) minimum.
  - b. High-Pressure Piping Specialty Valves: 250 psig (1725 kPa) minimum.
3. Body Material: Cast or ductile iron.
4. Size: Same as connected piping.
5. End Connections: Flanged or grooved.

Valves in first paragraph below are available in NPS 1-1/2 to NPS 8 (DN 40 to DN 200).

### B. Alarm Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Reliable Automatic Sprinkler Co., Inc.
  - b. Tyco Fire & Building Products LP.
  - c. Victaulic Company.
  - d. Viking Corporation.
2. Standard: UL 193.
3. Design: For horizontal or vertical installation.
4. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages, retarding chamber, and fill-line attachment with strainer.
5. Drip Cup Assembly: Pipe drain without valves and separate from main drain piping.

Retain first paragraph below for dry-type standpipes. Valves are available in NPS 1-1/2 to NPS 8 (DN 40 to DN 200).

### C. Dry-Pipe Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Reliable Automatic Sprinkler Co., Inc.
  - b. Tyco Fire & Building Products LP.
  - c. Victaulic Company.
  - d. Viking Corporation.
2. Standard: UL 260.
3. Design: Differential-pressure type.
4. Include UL 1486, quick-opening devices, trim sets for air supply, drain, priming level, alarm connections, ball drip valves, pressure gages, priming chamber attachment, and fill-line attachment.

Retain subparagraph below if system contains an air compressor.

5. Air Compressor:
  - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - 1) Viking Corporation.
  - b. Standard: UL's "Fire Protection Equipment Directory" listing.

Motor characteristics such as NEMA designation, temperature rating, service factor, enclosure type, and efficiency are specified in Division 21 Section "Common Motor Requirements for Fire Suppression Equipment." If different characteristics are required, insert paragraphs below to suit Project.

- c. Motor Horsepower: Fractional.
- d. Power: 120-V ac, 60 Hz, single phase.

D. Deluge Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. CLA-VAL Automatic Control Valves.
  - b. Reliable Automatic Sprinkler Co., Inc.
  - c. Tyco Fire & Building Products LP.
  - d. Victaulic Company.
  - e. Viking Corporation.
2. Standard: UL 260.
3. Design: Hydraulically operated, differential-pressure type.
4. Include trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages, drip cup assembly piped without valves and separate from main drain line, fill-line attachment with strainer, and push-rod chamber supply connection.

Retain first subparagraph below for wet-type standpipes, hydraulic manual control, or solenoid-valve actuation.

5. Wet, Pilot-Line Trim Set: Include gage to read push-rod chamber pressure, globe valve for manual operation of deluge valve, and connection for actuation device.

Retain first subparagraph below for dry-type standpipes; provide air supply.

6. Dry, Pilot-Line Trim Set: Include dry, pilot-line actuator; air- and water-pressure gages; low-air-pressure warning switch; air relief valve; and actuation device. Dry, pilot-line actuator includes cast-iron, operated, diaphragm-type valve with resilient facing plate, resilient diaphragm, and replaceable bronze seat. Valve includes threaded water and air inlets and water outlet. Loss of air pressure on dry, pilot-line side allows pilot-line actuator to open and causes deluge valve to open immediately.

Retain subparagraph below if system contains an air compressor.

7. Air Compressor:
  - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - 1) Viking Corporation.
  - b. Standard: UL's "Fire Protection Equipment Directory" listing.

Valves in first paragraph below are used on standpipe risers.

E. Pressure-Reducing Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Fire-End & Croker Corporation.
  - b. Guardian Fire Equipment, Inc.
  - c. Potter Roemer.
  - d. Tyco Fire & Building Products LP.

Indicate valve size and inlet and outlet pressures on Drawings for each pressure-reducing valve.

2. UL 668 hose valve, with integral UL 1468 reducing device.
3. Pressure Rating: 300 psig (2070 kPa) minimum.
4. Material: Brass or bronze.
5. Inlet: Female pipe threads.
6. Outlet: Threaded with or without adapter having male hose threads.
7. Pattern: Angle or gate.
8. Finish: Polished chrome plated.

F. Automatic (Ball Drip) Drain Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Reliable Automatic Sprinkler Co., Inc.
  - b. Tyco Fire & Building Products LP.

2. Standard: UL 1726.
3. Pressure Rating: 175 psig (1200 kPa) minimum.
4. Type: Automatic draining, ball check.
5. Size: NPS 3/4 (DN 20).
6. End Connections: Threaded.

## 2.7 HOSE CONNECTIONS

Coordinate cabinets with Division 10 Section "Fire Extinguisher Cabinets." Indicate size and design outlet pressure setting on Drawings for each hose connection. Hoses will not be provided.

### A. Nonadjustable-Valve Hose Connections:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Elkhart Brass Mfg. Company, Inc.
  - b. Fire-End & Croker Corporation.
  - c. Guardian Fire Equipment, Inc.
  - d. Kennedy Valve; a division of McWane, Inc.
  - e. Mueller Co.; Water Products Division.
  - f. NIBCO INC.
  - g. Potter Roemer.
  - h. Tyco Fire & Building Products LP.
2. Standard: UL 668 hose valve for connecting fire hose.
3. Pressure Rating: 300 psig (2070 kPa) minimum.
4. Material: Brass or bronze.
5. Size: NPS 2-1/2 (DN 65), as indicated.
6. Inlet: Female pipe threads.
7. Outlet: Male hose threads with lugged cap, gasket, and chain. Include hose valve threads according to NFPA 1963 and matching local fire-department threads.
8. Pattern: Angle.
9. Finish: Rough brass or bronze.

## 2.8 FIRE-DEPARTMENT CONNECTIONS

Coordinate fire-department connections with Division 21 Section "Wet-Pipe Sprinkler Systems" or "Dry-Pipe Sprinkler Systems." Confirm with ELFD.

### A. Flush-Type, Storz Type Fire-Department Connection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Elkhart Brass Mfg. Company, Inc.
  - b. Guardian Fire Equipment, Inc.
  - c. Potter Roemer.

2. Standard: UL 405.
3. Type: Flush, for wall mounting.
4. Pressure Rating: 175 psig (1200 kPa) minimum.
5. Body Material: Corrosion-resistant metal.
6. Inlets: 4" cast aluminum with Storz hose connection fitting
7. Caps: Storz connection, aluminum with gasket and chain.
8. Escutcheon Plate: Rectangular, brass, wall type.
9. Outlet: With pipe threads.
10. Body Style: Horizontal.
11. Number of Inlets: Two.
12. Outlet Location: Back.
13. Escutcheon Plate Marking: Similar to "AUTO SPKR & STANDPIPE" or "STANDPIPE."
14. Finish: Polished brass (rough brass or bronze)
15. Outlet Size: NPS 5 (DN 100).

## 2.9 ALARM DEVICES

### A. Alarm-device types shall match piping and equipment connections.

Retain remaining paragraphs if devices are specified in this Section, or delete if devices are specified in Division 28 Sections "Digital, Addressable Fire-Alarm System" and "Zoned (DC Loop) Fire-Alarm System."

### B. Water-Motor-Operated Alarm:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Tyco Fire & Building Products LP.
  - b. Victaulic Company.
  - c. Viking Corporation.
2. Standard: UL 753.
3. Type: Mechanically operated, with Pelton wheel.
4. Alarm Gong: Cast aluminum with red-enamel factory finish.
5. Size: 10-inch (250-mm) diameter.
6. Components: Shaft length, bearings, and sleeve to suit wall construction.
7. Inlet: NPS 3/4 (DN 20).
8. Outlet: NPS 1 (DN 25) drain connection.

### C. Electrically Operated Alarm Bell:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Fire-Lite Alarms, Inc.; a Honeywell company.
  - b. Notifier; a Honeywell company.
  - c. Potter Electric Signal Company.

2. Standard: UL 464.
3. Type: Vibrating, metal alarm bell.
4. Size: 10-inch (250-mm) diameter.
5. Finish: Red-enamel factory finish, suitable for outdoor use.

D. Water-Flow Indicators:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. McDonnell & Miller; ITT Industries.
  - b. Potter Electric Signal Company.
  - c. System Sensor; a Honeywell company.
  - d. Viking Corporation.
  - e. Watts Industries (Canada) Inc.
2. Standard: UL 346.
3. Water-Flow Detector: Electrically supervised.
4. 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.
5. Type: Paddle operated.
6. Pressure Rating: 250 psig (1725 kPa).
7. Design Installation: Horizontal or vertical.

E. Pressure Switches:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Potter Electric Signal Company.
  - b. System Sensor; a Honeywell company.
  - c. Tyco Fire & Building Products LP.
  - d. Viking Corporation.
2. Standard: UL 346.
3. Type: Electrically supervised water-flow switch with retard feature.
4. Components: Single-pole, double-throw switch with normally closed contacts.
5. Design Operation: Rising pressure signals water flow.

F. Valve Supervisory Switches:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Fire-Lite Alarms, Inc.; a Honeywell company.
  - b. Kennedy Valve; a division of McWane, Inc.
  - c. Potter Electric Signal Company.

- d. System Sensor; a Honeywell company.
  2. Standard: UL 346.
  3. Type: Electrically supervised.
  4. Components: Single-pole, double-throw switch with normally closed contacts.
  5. Design: Signals that controlled valve is in other than fully open position.
- G. Indicator-Post Supervisory Switches:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Potter Electric Signal Company.
    - b. System Sensor; a Honeywell company.
  2. Standard: UL 346.
  3. Type: Electrically supervised.
  4. Components: Single-pole, double-throw switch with normally closed contacts.
  5. Design: Signals that controlled indicator-post valve is in other than fully open position.

## 2.10 PRESSURE GAGES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AMETEK; U.S. Gauge Division.
  2. Ashcroft Inc.
- B. Standard: UL 393.
- C. Dial Size: 3-1/2- to 4-1/2-inch (90- to 115-mm) diameter.
- D. Pressure Gage Range: 0 to 250 psig (0 to 1725 kPa) minimum.
- E. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.
- F. Air System Piping Gage: Include retard feature and "AIR" or "AIR/WATER" label on dial face.

## PART 3 - EXECUTION

### 3.1 PREPARATION

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



- 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 EXAMINATION

- A. Examine roughing-in for hose connections and stations to verify actual locations of piping connections before installation.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 SERVICE-ENTRANCE PIPING

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

- A. Connect fire-suppression standpipe piping to water-service piping at service entrance into building. Comply with requirements for exterior piping in Division 21 Section "Facility Fire-Suppression Water-Service Piping."
- B. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories at connection to fire-suppression water-service piping. Comply with requirements for backflow preventers in Division 22 Section "Domestic Water Piping Specialties."

### 3.4 WATER-SUPPLY CONNECTIONS

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

- A. Connect fire-suppression standpipe piping to building's interior water-distribution piping. Comply with requirements for interior piping in Division 22 Section "Domestic Water Piping."
- B. Install shutoff valve, backflow preventer, pressure gage, drain, and other accessories at connection to water-distribution piping. Comply with requirements for backflow preventers in Division 22 Section "Domestic Water Piping Specialties."

### 3.5 PIPING INSTALLATION

- A. Refer to Division 21 Section "Common Work Result for Fire Suppression" for basic installation requirements.

- B. 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.
- C. Piping Standard: Comply with requirements in NFPA 14 for installation of fire-suppression standpipe piping.
- D. Install listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install drain valve at the bottom of each riser. The minimum 1" riser drain lines shall terminate to the nearest floor drain with funnel or to a service sink.
- F. Install automatic (ball drip) drain valves to drain piping between fire-department connections and check valves. Drain to floor drain or outside building.
- G. Install alarm devices in piping systems. A flow alarm switch shall be provided in the feed main and shall be wired into the fire alarm system. A separate flow alarm switch for the standpipe risers is not required for the combined system.
- H. Install hangers and supports for standpipe system piping according to NFPA 14. Comply with requirements in NFPA 13 for hanger materials.
- I. Install pressure gages on riser or feed main and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 (DN 8) and with soft-metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.
- J. Drain dry-type standpipe system piping.
- K. Pressurize and check dry-type standpipe system piping and air compressors.
- L. Provide an air cushion approved pressure gauge with 3-way valve connections at the top of each standpipe in an easily visible location such as a stairwell.
- M. Fill wet-type standpipe system piping with water.
- N. 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 Division 21 Section "Heat Tracing for Fire-Suppression Piping" and for piping insulation in Division 21 Section "Fire-Suppression Systems Insulation."
- O. Connect air compressor to the following piping and wiring:
  - 1. Pressure gages and controls.
  - 2. Electrical power system.

3. Fire-alarm devices, including low-pressure alarm.

### 3.6 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 according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to 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, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- I. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- J. 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.

### 3.7 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 14 and authorities having jurisdiction.

- B. Install listed fire-protection shutoff valves supervised-open, 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. System water supply valves, isolation control valves, and other valves in feed mains shall be supervised with tampers and also be locked open. Padlocks with Best cylinders will be provided by MSU, and installed by the Contractors.
- D. Install backflow preventers in potable-water-supply sources.
- E. 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. Dry-Pipe and Deluge Valves: Install trim sets for air supply, drain, priming level, alarm connections, ball drip valves, pressure gages, priming chamber attachment, and fill-line attachment.
    - a. Install air compressor and compressed-air supply piping.

### 3.8 HOSE-CONNECTION INSTALLATION

- A. Install hose connection adjacent to standpipes..

### 3.9 FIRE-DEPARTMENT CONNECTION INSTALLATION

- A. Install wall-type, fire-department connections.
- B. Install automatic (ball drip) drain valve at each check valve for fire-department connection.

### 3.10 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 14.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

### 3.11 FIELD QUALITY CONTROL

- A. Perform tests and inspections.

Retain first paragraph below to describe tests and inspections to be performed.

- 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 according to NFPA 14, "System Acceptance" Chapter.
  4. Energize circuits to electrical equipment and devices.
  5. Start and run air compressors.
  6. Coordinate with fire-alarm tests. Operate as required.
  7. Coordinate with fire-pump tests. Operate as required.
  8. 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.

### 3.12 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain specialty valves.

### 3.13 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. Piping between Domestic Water Supply Connection and Backflow Preventers: Galvanized, standard-weight steel pipe with grooved ends; grooved-end fittings; grooved-end-pipe couplings; and grooved joints.
- C. Standard-pressure, wet-type, fire-suppression standpipe piping, NPS 2 and smaller, shall be the following:
1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
- D. Standard-pressure, wet-type, fire-suppression standpipe piping, NPS 2-1/2 and larger, shall be one of the following:
1. Standard-weight, 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.
  2. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.

- E. High-pressure, wet-type, fire-suppression standpipe piping, NPS 2 and smaller, shall be one of the following:
  - 1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
  
- F. High-pressure, wet-type, fire-suppression standpipe piping, NPS 2-1/2 and larger, shall be one of the following:
  - 1. Standard-weight, 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.
  - 2. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.
  
- G. Standard-pressure, dry-type, fire-suppression standpipe piping, NPS 2 and smaller, shall be one of the following:
  - 1. Standard-weight, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
  
- H. Standard-pressure, dry-type, fire-suppression standpipe piping, NPS 2-1/2 and larger, shall be one of the following:
  - 1. Standard-weight, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

END OF SECTION 211200