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SECTION 13955 - FOAM FIRE EXTINGUISHING

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

PART 1 - GENERAL

1.1 SUMMARY

This Section is intended to be used with Division 13 Section "Fire-Suppression Piping," which specifies sprinkler piping, valves, and valve specialties that comprise a complete foam-water system.

- A. This Section includes fixed, low-expansion, AR-AFFF fire-extinguishing systems.
- B. See Division 13 Section "Fire-Suppression Piping" for water supply and foam-water piping materials and specialties and controls.

1.2 SYSTEM DESCRIPTION

Convey basic foam system design intent here. This Article is a sample description of a basic system. Edit to suit Project.

- A. Description: Engineered, fixed, [**wet-pipe**] [**dry-pipe**] [**preaction**] [**deluge**], automatically actuated, low-expansion, AR-AFFF fire-extinguishing system for flammable-liquid fires. System includes diaphragm proportioning tanks and devices as described in NFPA 16.

1.3 PERFORMANCE REQUIREMENTS

- A. Standard Piping System Component Working Pressure: Listed for at least 175 psig (1200 kPa).
- B. Minimum design parameters to be used with the approval of authorities having jurisdiction are as follows:
 - 1. Solution: [**3**] <Insert number> percent foam-water solution.
 - 2. Sprinkler Spacing: Maximum of [**100 sq. ft. (9.5 sq. m)**] <Insert area> per sprinkler, and maximum [**12-foot (3.7-m)**] <Insert spacing> spacing.
 - 3. Design Density: Minimum [**0.16 gpm/sq. ft. (0.108 L/s per sq. m)**].
 - 4. Foam Supply: Minimum [**10**] <Insert number>-minute discharge time.
 - 5. Water Supply: Minimum [**60**] <Insert number> minutes.

6. Remote Area: Minimum [5000-sq. ft. (476-sq. m)] <Insert area> design area for closed-sprinkler systems. Open-sprinkler systems shall discharge over the entire system area.
7. Sprinkler Temperature Rating: Maximum 250 to 300 deg F at a roof or ceiling, and 135 to 170 deg F (57 to 77 deg C) for intermediate sprinklers.

1.4 SUBMITTALS

- A. Product Data: For the each product indicated.
- B. Permit-Approved Drawings: Working plans, prepared according to NFPA 16, that have been approved by authorities having jurisdiction. Include design calculations.
- C. Field quality-control test reports.
- D. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products.

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Retain above for nonproprietary or below for semiproprietary specification. Refer to Division 1 Section "Product Requirements."

- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Ansul Incorporated.
 2. Chemguard Inc.
 3. National Foam, Inc.; Division of Kidde Fire Fighting.
 4. Viking Corporation (The).
 5. <Insert manufacturer's name.>

2.2 PIPE AND FITTINGS

- A. Stainless Steel: ASTM A 312/A 312M, Schedule 40, with factory-formed threaded or beveled ends; ASTM A 376/A 376M for seamless pipe; or ASTM A 213/A 213M, ASTM A 249/A 249M, and ASTM A 269 for seamless and welded tubing.
1. Class 150 Threaded Fittings: ASME B16.3 and MSS SP 114.
 2. Butt-Weld Fittings: ASTM A 403/A 403M.
 3. Flanges, Forged Fittings and Flanges, and Socket-Weld Fittings: ASTM A 182/A 182M.
 4. Bar Stock and Compression Fittings: ASTM A 276 and ASTM A 479/A 479M.

2.3 VALVES

- A. Ball Valves: Bronze body with threaded or flanged ends. Comply with UL 1091, except with stainless-steel ball instead of disc. Valves shall be listed and labeled by a Nationally Recognized Testing Laboratory acceptable to authorities having jurisdiction.

2.4 SPECIALTIES

Show tank capacity on Drawings.

- A. Concentrate Storage Tank: Buna-N, bladder-type proportioning tank complying with UL 162 and ASME Boiler and Pressure Vessel Code: Section VIII. Include bladder, internal piping, fill and drain, pipe assembly, glass sight gage, piping, and valves. Concentrate to be contained in the bladder.
1. Orientation: [**Horizontal design with saddle**] [**Vertical design with skirt**] support.
- B. Proportioning Controller: Venturi type complying with UL 162 and of capacity to match design at minimum and maximum flow.
- C. Concentrate Control Valve: Water-operated ball or deluge valve designed to open with flow through the proportioning controller.
- D. Concentrate Strainers: Bronze body and stainless-steel mesh strainer with minimum 0.125-inch (3.2-mm) perforations to remove solids that would block system components.
- E. Devices shall comply with NFPA 16, and shall be compatible with the foam concentrate, and are designed to be drained and cleaned.

2.5 FOAM CONCENTRATE

- A. Description: AR-AFFF liquid concentrate, complying with NFPA 11 and UL 162, for making foam-water fire-extinguishing foam solution.

2.6 PRESSURE GAGES

- A. Description: Comply with UL 393, with 3-1/2-inch- (90-mm-) minimum diameter dial, 0- to 300-psig (0- to 2070-kPa) dial range, and caption "WATER" or "CONCENTRATE" on dial face. Gages shall be listed and labeled by a Nationally Recognized Testing Laboratory acceptable to authorities having jurisdiction.

2.7 DISCHARGE DEVICES

- A. General: Discharge devices shall be listed and labeled by a Nationally Recognized Testing Laboratory acceptable to authorities having jurisdiction.

Retain closed, non-air-aspirating sprinklers for wet-pipe, dry-pipe, and preaction systems. Retain open, non-air-aspirating or air-aspirating sprinklers for deluge systems.

- B. Sprinklers: [**Closed,**] [**Open,**] [**non-**]air-aspirating type complying with UL 162 and suitable for discharging foam.
- C. Spray Nozzles: Foam-water spray nozzles including foam generator and distributing deflector complying with UL 162 and designed to distribute foam or water in the absence of foam solution in a special pattern peculiar to a particular head.

2.8 MONITORING DEVICES

- A. Valve Supervisory Switches: UL 753, electrical, single pole, double throw, with normally closed contacts. Include design that signals controlled valve is in other than fully open position. Switches shall be listed and labeled by a Nationally Recognized Testing Laboratory acceptable to authorities having jurisdiction.

2.9 ALARM DEVICES

Delete this Article for wet- and dry-pipe, closed-sprinkler systems that are specified in Division 13 Section "Fire-Suppression Piping." Division 13 Section "Fire Alarm" specifies preaction and deluge system actuation and monitoring devices.

- A. Description: Devices shall be listed and labeled by a Nationally Recognized Testing Laboratory acceptable to authorities having jurisdiction; low voltage and surface mounting. Alarm and monitoring devices are specified in Division 13 Section "Fire Alarm."

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install proportioning tanks anchored to concrete bases. Concrete bases are specified in Division 15 Section "Basic Mechanical Materials and Methods."

- B. Flanged pipe and fittings and flanged joints may be used to connect to specialties and accessories and where required for maintenance.
- C. AR-AFFF-Concentrate Piping: Stainless-steel pipe with welded fittings and joints.
- D. Foam-solution piping is specified in Division 13 Section "Fire-Suppression Piping."
- E. Install piping and other components level and plumb.
- F. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic pipe installation and joint construction.
- G. Install pipe and fittings, valves, and discharge devices according to NFPA 16, "Installation of Deluge Foam-Water Sprinkler and Foam-Water Spray Systems."
 - 1. Support piping using supports and methods according to NFPA 13.
 - 2. Install monitoring and alarm devices according to NFPA 16 and NFPA 72.
- H. Fill proportioning tanks with foam concentrate after field quality-control testing is complete and satisfactory results have been achieved.

3.2 FIELD QUALITY CONTROL

- A. Test foam fire extinguishing system tests according to NFPA 16, "Acceptance Tests" Chapter.
- B. Remove and replace malfunctioning units and retest as specified above.
- C. Report test results to authorities having jurisdiction.

END OF SECTION 13955