SECTION 21 1314D - AUTOMATIC SPRINKLER SYSTEMS (DRY-PIPE)

1.2 SUMMARY

A. Section Includes:

1. Aboveground fire protection pipe, fittings
above finished floor, 1'-0" inside the exter
water line as shown on the drawings.
2. Fire-protection valves, and compressors.
3. Fire-department connections.
4. Sprinkler specialty pipe fittings.
5. Sprinklers.
6. Alarm devices.
7. Pressure gages.
8. Backflow preventers.

1.3 SYSTEM DESCRIPTIONS

A. Dry-Pipe Sprinkler System: Automatic sprinkle
compressed air. Opening of sprinklers releases
open dry-pipe valve. Water then flows into piping

1.4 PERFORMANCE REQUIREMENTS

A. Standard-Pressure Piping System Component: I

B. Delegated Design: Design sprinkler system(s),
by a properly licensed and qualified professional
design criteria indicated. Professional Enginee
sprinkler system drawings. Professional Enginee

1. The Contractor shall perform a flow test in
obtain water design data from the Local
drawings.

C. Sprinkler system design shall be approved by au

1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
2. Sprinkler Occupancy Hazard Classifications, densities, and head spacing shall be as indicated on the drawings.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For dry-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.

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

C. Delegated-Design Submittal: For sprinkler 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.

D. Qualification Data: For qualified Installer and Professional Engineer.

E. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.

F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."

G. Field quality-control reports.

H. Operation and maintenance data.

I. At closeout, Northwestern University Maintenance Requirement Forms, refer to Division 01 for more information.

1.6 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems 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. 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.

C. NFPA Standards and Other Requirements: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13, "Installation of Sprinkler Systems."
2. NFPA 14, "Standpipe and Hose Systems."

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a. Anvil International, Inc.
b. Shurjoint Piping Products.

I. Grooved-Joint, Steel-Pipe Appurtenances:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Anvil International, Inc.
b. Corcoran Piping System Co.
c. Shurjoint Piping Products.
d. Tyco Fire & Building Products LP.
e. Victaulic Company.

2. Pressure Rating: 175 psig 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.
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: AWWA C110, rubber, flat face, 1/8 inch thick.

1. Class 125, Flat-Face Flanges: Full-face gaskets.

B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

2.4 LISTED FIRE-PROTECTION VALVES -

1. Standard: UL 262.
2. Pressure Rating: 250 psig.
3. Body Material: Cast or ductile iron.
4. End Connections: Flanged or grooved.

E. Ball Valves 2” and smaller:

1. Standard: UL 1091.
2. Pressure Rating: 175 psig minimum.
3. Body Material: Bronze.
4. End Connections: Threaded.

F. Indicating-Type Butterfly Valves (preferred):

1. Standard UL 1091.
2. Pressure Rating: 175 psig minimum.
3. Valve Type: Butterfly.
4. Body Material: Cast or ductile iron.
5. End Connections: Flanged, grooved, or wafer.
6. Valve Operation: Integral electrical, 115-V ac, prewired, single-circuit, supervisory switch indicating device.

2.5 TRIM AND DRAIN VAMCID 16 >>BDC -0.002 TT2. orMCI.>2B33TIgi

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1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig minimum.
3. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
4. Size: Same as connected piping.
5. Inlet and Outlet: Threaded.

D. Zone/Floor Control Module:

E. 1. UL listed, FM approved complete with flow switch, pressure gage, and ball valve.

F. Branch Line Testers:

1. Standard: UL 199.
2. Pressure Rating: 175 psig minimum.
3. Body Material: Brass.
4. Size: Same as connected piping.
5. Inlet: Threaded.
6. Drain Outlet: Threaded and capped.
7. Branch Outlet: Threaded, for sprinkler.

G. Sprinkler Inspector's Test Fittings:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig minimum.
3. Body Material: Cast- or ductile-iron housing with sight glass.
4. Size: Same as connected piping.
5. Inlet and Outlet: Threaded.

H. Adjustable Drop Nipples:

1. Standard: UL 1474.
2. Pressure Rating: 250 psig minimum.
3. Body Material: Steel pipe with EPDM O-ring seals.
4. Size: Same as connected piping.
5. Length: Adjustable.
6. Inlet and Outlet: Threaded.

I. Flexible, Sprinkler Hose Fittings:

1. Standard: UL 1474.
2.

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4. Design: Signals that controlled valve is in other than fully open position. Also, external tamper switches or external wired tamper switches are required.

D. Special Electrical Connection Requirements

1. For all devices/components requiring monitoring and/or supervision, provide each with 2 sets of contacts, one for fire alarm system connection and one for Division 25 system connection.

2.11 PRESSURE GAGES

A. Standard: UL 393.

B. Dial Size: 3-1/2- to 4-1/2-inch diameter.

C. Pressure Gage Range: 0 to 300 psig.

D. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face, as directed by the University/AHJ.

E. Air System Piping Gage: Include retard feature and "AIR" or "AIR/WATER" label on dial face, as directed by the University/AHJ.

2.12 BACKFLOW PREVENTERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide a Conbraco RPDA reduced pressure detector backflow preventer assemblies. The assemblies

PART 3 - EXECUTION

3.1 WATER-SUPPLY CONNECTIONS

A. Connect sprinkler pipi

2. Dry-Pipe 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.

4. Sleeves for Piping Passing through Exterior Concrete Walls:

    a. Galvanized-steel-pipe sleeves for pipes smaller than 6 inch.
    b. Cast-iron wall pipe sleeves for pipes 6 inch and larger.
    c. Install sleeves that are large enough to provide 1 inch annular clear space between sleeve and pipe when sleeve seals are used.

5. Sleeves for Piping Passing through Interior Concrete Walls:

    a. Galvanized-steel pipe sleeves for pipes smaller than 6 inch.
    b. Galvanized-steel-sheet sleeves for pipes 6

C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.12 CLEANING

A. Clean dirt and debris from sprinklers.

B. Remove and replace sprinklers with paint other than factory finish.

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. Sprinkler specialty fittings may be used, downstream of control vales, instead of specified fittings.

C. Dry-pipe sprinkler system, 2 inches and smaller, shall be one of the following:

1. Standard-weight or Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Standard-weight Schedule 30 or thinwall, galvanized-steel pipe with plain ends; plain-end-pipe fittings; and twist-locked joints.
3. Standard-weight 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.

D. Dry-pipe sprinkler system, 2-1/2 inches to 6 inches, shall be one of the following:

1. Standard-weight or Schedule 30, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
2. Standard-weight 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.

END OF SECTION 21 1314D

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