SECTION 21 13 00

FIRE PROTECTION SPRINKLERS

PART 1 – GENERAL

1.1 PURPOSE

A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 **LESSONS LEARNED AND DESIGN CONSIDERATIONS**

A.

1.3 SECTIONS INCLUDES

A. Wet-pipe sprinkler system.
B. Pre-action sprinkler system.
C. System design, installation, and certification.
D. Fire department connections.

1.4 RELATED REQUIREMENTS

A. Section 22 0548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
B. Section 22 0553 - Identification for Plumbing Piping and Equipment.

1.5 REFERENCE STANDARDS

A. NFPA 13 - Standard for the Installation of Sprinkler Systems; 2019
B. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems; 2019.
C. NFPA 20 - Standard for the Installation of Stationary Pumps for Fire Protection; 2019.
D. NFPA 25 - Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems; 2020.
E. NFPA 30 - Flammable and Combustible Liquids Code; 2018.
F. NFPA 45 - Standard on Fire Protection for Laboratories Using Chemicals; 2019.
G. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
H. UL 405 - Fire Department Connection Devices; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
I. Fire suppression, fire sprinkler systems shall be designed by a licensed State of Texas Fire Protection Engineer.
J. Texas Insurance Code – Chapter 6003
K. Texas Administrative Code – Section 34.700
L. The Texas State Fire Marshal's Office (SFMO) is the authority having jurisdiction (AHJ).

1.6 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
C. Shop Drawings:
    1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
    2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls. Provide safety margin of 10psi or 10%, whichever is less.
    3. Submit shop drawings to Authority Having Jurisdiction for approval. Submit proof of approval to Architect.
D. Samples: Submit two of each style of sprinkler specified.

E. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.
F. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
   2. Sprinkler Wrenches: For each sprinkler type.
H. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.

1.7 QUALITY ASSURANCE
A. Maintain one copy of referenced design and installation standard on site.
B. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
C. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
D. Installer Qualifications: Company specializing in performing the work of this section with minimum five years' experience and approved by manufacturer.
E. Equipment and Components: Provide products that bear FM label or marking.
F. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

1.8 MOCK-UP
A. Provide components for installation in mock-up.

1.9 DELIVERY, STORAGE, AND HANDLING
A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

PART 2 – PRODUCTS

2.1 SPRINKLER SYSTEM
A. Sprinkler System: Provide coverage for entire building.
B. Occupancy: As shown on fire protection (FP) drawings.
C. Water Supply: Determine volume and pressure from water flow test data.
D. Interface system with building control system.
E. Provide fire department connections as shown on fire protection (FP) drawings.
F. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.2 SPRINKLERS
A. Suspended Ceiling Type: Semi-recessed pendant type with matching push on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Chrome plated.
   4. Fusible Link: Glass bulb type temperature rated for specific area hazard.
B. Exposed Area Type: Pendant or Upright type with guard.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Brass.
   4. Fusible Link: Glass bulb type temperature rated for specific area hazard.
C. Architectural Sensitive Ceiling Type: Concealed pendant type with matching push on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Enamel, color as selected.
   4. Escutcheon Plate Finish: Enamel, color as selected.
   5. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

D. Guards: Finish to match sprinkler finish.

2.3 PIPING SPECIALTIES

A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm, pressure retard chamber and variable pressure trim with the following additional capabilities and features:
   1. Activate electric alarm.
   2. Test and drain valve.
   3. Replaceable internal components without removing valve from installed position.

B. Preaction Valve:
   1. Operated by detection system listed for releasing service and independent of building fire alarm system with provisions for local, manual, and indicated remote releases.
   2. Incorporate mechanical latching mechanism incorporating valve clappers independent of system water pressure fluctuations.
   3. Provide test detection device for each actuation circuit adjacent to each controlled valve in accordance with NFPA 13.

C. Test Connections:
   1. Inspector's Test Connection for Preaction Systems:
      a. Provide test connections approximately 6 ft above floor for each or portion of each sprinkler system equipped with an alarm device, located at the most remote part of each system.
      b. Route test connection to an open-site drain location, excluding janitor sinks, accepting full flow without negative consequences.
      c. Supply discharge orifice with same size as corresponding sprinkler orifice.
      d. Limit vertical height of exterior wall penetration to 2 ft above finished grade.

D. Electric Alarm: Electrically operated chrome plated gong with pressure alarm switch.

E. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.

F. Fire Department Connections:
   1. Type: Exposed, projected wall mount made of corrosion resistant metal complying with UL 405.
      a. Inlets: 4" straight pattern Storz connection. Forged aluminum with powder coat finish. Blind cap with securing wire and chain.
      b. Rated Working Pressure: 175 psi.
      c. Finish: Chrome.
      d. Signage: Raised or engraved lettering 1 inch minimum indicating system type.

2.4 PREACTION VALVE CONTROL PANEL

A. Manufacturers:
   1. Simplex Grinnell.

B. Provide a modular type control panel for electrically operated detection and extinguishing systems for each preaction valve.
   1. Factory mount in surface mounted, steel cabinet with hinged doors, and cylinder lock.
   2. Provide factory wired assembly containing components and equipment as required to perform specified system operating and supervisory functions.
   3. Include isolation switch to allow system testing without activation of the preaction valve.
   4. House batteries in separate and lockable, steel cabinet.
   5. Finish interior and exterior of cabinet with enamel paint and provide identification plates in accordance with Section 22 0553.
   6. Include trouble lights and trouble alarm.
   7. Provide 120 volt AC service transformed through a two-winding, isolation type transformer and rectified to low voltage DC for operation of all system actuating, signal sounding, trouble signal, and fire alarm tripping circuits.
   8. Provide <|UL (DIR)|> listed as an extinguishing system releasing panel and separate from the building's fire alarm control panel.

C. Secondary Power Supply:
   1. Provide separate connection for building emergency power system.

2.5 AIR COMPRESSOR

A. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve.
B. Tank: Floor mounted
C. Accessories: Include flexible hose connections.
D. Operation: Automatic with pressure switch actuation.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install in accordance with referenced NFPA design and installation standard.
B. Install equipment in accordance with manufacturer's instructions.
C. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
D. Locate outside alarm gong on building wall as indicated.
E. Place pipe runs to minimize obstruction to other work.
F. Place piping in concealed spaces above finished ceilings.
G. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
H. Install air compressor on vibration isolators. Refer to Section 22 0548.
I. Flush entire piping system of foreign matter.
J. Install guards on sprinklers where indicated.
K. Hydrostatically test entire system.
L. Require test be witnessed by UTA Fire Program Staff and UTA 3rd party fire and life safety engineer/representative.

END OF SECTION