SECTION 21 13 00

FIRE SUPPRESSION SPRINKLERS

**PART 1 GENERAL**

1. **SECTION INCLUDES**
2. Wet-pipe sprinkler system.
3. Alarm Valve Assembly
4. Automatic Control Valve Assembly
5. **RELATED REQUIREMENTS**
6. Section 21 0500 - Common Work Results for Fire Suppression: Pipe and fittings.
7. Section 21 0523 - General-Duty Valves for Water-Based Fire-Suppression Piping.
8. Section 21 0548 - Vibration and Seismic Controls for Fire Suppression Piping and Equipment.
9. Section 21 0553 - Identification for Fire Suppression Piping and Equipment.
10. Section 21 1200 - Fire-Suppression Standpipes.
11. Section 21 3000 - Fire Pumps.
12. Section 22 0548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
13. Section 26 2717 - Equipment Wiring: Electrical characteristics and wiring connections.
14. Section 28 3100 - Fire Detection and Alarm.
15. **REFERENCE STANDARDS**
16. FM (AG) - FM Approval Guide; current edition.
17. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2012.
18. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry

Elements; 2012.

1. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2013.
2. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete

Elements; 2013.

1. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
2. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2016.
3. NFPA 1963 - Standard for Fire Hose Connections; 2014.
4. UL (DIR) - Online Certifications Directory; Underwriters Laboratories Inc.; current listings at database.ul.com.
5. UL 405 - Fire Department Connection Devices; Current Edition; Including All Revisions.
6. **ADMINISTRATIVE REQUIREMENTS**
7. Pre installation Meeting: Convene one week before starting work of this section.
8. **SUBMITTALS**
9. 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.
10. Shop Drawings:
11. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
12. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
13. Submit shop drawings to Authorities Having Jurisdiction for approval. Submit proof of approval to Architect/Engineer.
14. Samples: Submit two of each style of sprinkler specified.
15. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.
16. 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.
17. Maintenance Materials: Furnish the following for Employer/Owner's use in maintenance of project.
18. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
19. Sprinkler Wrenches: For each sprinkler type.
20. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
21. **QUALITY ASSURANCE**
22. Maintain one copy of referenced design and installation standard on site.
23. Conform to FM (AG) and/or UL (DIR) requirements
24. Conform to the UAE FIRE AND LIFE SAFETY CODE OF PARCTICE and to local civil defense requirement.
25. 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.
26. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
27. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience.
28. Equipment and Components: Provide products that bear FM (AG) or UL (DIR) label or marking.
29. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
30. **DELIVERY, STORAGE, AND HANDLING**
31. 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**

1. **SPRINKLER SYSTEM**
2. Interface system with building fire and smoke alarm system.
3. Provide fire department connections as indicated on drawings.
4. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.
5. Pipe Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
6. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
7. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
8. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
9. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
10. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
11. Other Types: As required.
12. **SPRINKLERS**

A. Suspended Ceiling Type: Recessed pendant type with matching screw on escutcheon plate.  
1. Response Type: Quick.  
2. Coverage Type: Standard.  
3. Finish: Enamel, color to match ceiling color.  
4. Escutcheon Plate Finish: Enamel, color to match ceiling color.  
5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

B. Exposed Area Type: Upright type with guard.  
1. Response Type: Quick.  
2. Coverage Type: Standard.  
3. Finish: Brass.  
4. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

C. Sidewall Type: Recessed horizontal sidewall type with matching push on escutcheon plate.  
1. Response Type: Quick.  
2. Coverage Type: Standard and extended.  
3. Finish: Enamel, color to match ceiling color.  
4. Escutcheon Plate Finish: Enamel, color to match ceiling color.  
5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

1. **PIPING SPECIALTIES**
2. 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:
3. Activate electric alarm.
4. Test and drain valve.
5. Replaceable internal components without removing valve from installed position.
6. Test Connections:

1. Backflow Preventer Test Connection:

1. Provide downstream of the backflow prevention assembly, listed hose valves with 65 mm (2.5 inch) National Standard male hose threads with cap and chain.
2. Furnish one valve for each 16 L/s (250 gpm) of system demand or fraction thereof.
3. Provide permanent sign reading "Test Valve" in accordance with Section 22 0553.
4. Water Motor Alarm: Hydraulically operated impeller type alarm with aluminum alloy chrome plated gong and motor housing, nylon bearings, and inlet strainer.
5. Electric Alarm: Electrically operated chrome plated gong with pressure alarm switch.
6. 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.
7. Supervisory Switches: Install for all fire water control valves and shall be UL listed FM approved, and constructed and installed in a manner that any flow of water from sprinkler system equal or greater than from a single automatic sprinkler will actuate the alarm system. Water flow switch including alarm circuits shall be tested by an actual water flow through use of the test connection.
8. **ALARM VALVE ASSEMBLY**
9. Alarm valve assembly shall be UL listed FM approved
10. Main Alarm valve assembly shall comprise: alarm check valve, two indicating OS&Y gate Valves equipped with tamper switch, water flow switch, test connection, two pressure gauges and drainage outlet.
11. Water flow switch shall be UL listed FM approved, and constructed and installed in a manner that any flow of water from sprinkler system equal or greater than from a single automatic sprinkler will actuate the alarm system. Water flow switch including alarm circuits shall be tested by an actual water flow through use of the test connection.
12. **AUTOMATIC CONTROL VALVE ASSEMBLY**
13. A. Provide UL listed/ FM approved automatic zone check (zone control valve) assembly for each sprinkler system zone as required and as indicated on the Design Drawings in accordance with NFPA 13 and as per the requirements of local statutory authorities.
14. Automatic zone check assembly shall have the following components:
15. UL listed and FM approved indicating butterfly valve with lockable gear operator
16. UL listed and FM approved water flow alarm switch for the size of the pipe in which it is installed as a paddle type water flow indicator, which shall be fixed after the butterfly valve, on the main supply pipe and before any connection is taken off.
17. Inspector test and drain connections.
18. Dial pressure gages suitable for the water pressures shall be fitted so arranged that it can be easily removed for testing and checking without shutting down the water supply.
19. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 250-volt AC and 2.5 amp at 24-volt DC. Water Flow Switch shall be UL Listed and FM Approved and in accordance with NFPA 72.

**PART 3 EXECUTION**

1. **INSTALLATION**
2. Install in accordance with referenced NFPA design and installation standard.
3. Install equipment in accordance with manufacturer's instructions.
4. Install buried shut-off valves in valve box. Provide post indicator.
5. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent Siamese connectors to allow full swing of fire department wrench handle.
6. Locate outside alarm gong on building wall as indicated.
7. Place pipe runs to minimize obstruction to other work.
8. Place piping in concealed spaces above finished ceilings.
9. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
10. 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.
11. Flush entire piping system of foreign matter.
12. Install guards on sprinklers in stores and plant rooms.
13. Hydrostatically test entire system.
14. Require test be witnessed by Authority Having Jurisdiction.
15. **INTERFACE WITH OTHER PRODUCTS**
16. Ensure required devices are installed and connected as required to fire alarm system.

**END OF SECTION**