

POWERS FASTENERS

Sample Specification

Section 21 13 xx – Fire Suppression Sprinklers

The intent of this Sample Specification is to illustrate the use of ICC-ES Acceptance Criteria as reference standards in the proper specification of concrete anchors and fasteners which meet the requirements of the International Building Code. Powers Fasteners assumes no liability for any errors and omissions within this Sample Specification and/or its improper use. Please consult with a design professional prior to specifying any product.

SECTION 21 13 xx
FIRE SUPPRESSION SPRINKLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section **28 3100** - <<*Fire Detection and Alarm*; or _____>>.
- B. Section **21 0500** - <<*Common Work Results for Fire Suppression*; or _____>>: Pipe, fittings, and valves.
- C. Section **21 0548** - <<*Vibration and Seismic Controls for Fire Suppression Piping and Equipment*; or _____>>.
- D. Section **21 0553** - <<*Identification for Fire Suppression Piping and Equipment*; or _____>>.
- E. Section **21 3000** - <<*Fire Pumps*; or _____>>.
- F. Section **21 1200** - <<*Fire-Suppression Standpipes*; or _____>>.
- G. Section **14 9100** - <<*Facility Chutes*; or _____>>: Sprinkler heads inside chutes.
- H. Section **22 0548** - <<*Vibration and Seismic Controls for Plumbing Piping and Equipment*; or _____>>.
- I. Section **22 0553** - <<*Identification for Plumbing Piping and Equipment*; or _____>>.
- J. Section **26 2717** - <<*Equipment Wiring*; or _____>>: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. FM P7825 - Approval Guide; Factory Mutual Research Corporation; **current edition**.
- B. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; **2009**.
- C. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry Elements; **2006**.
- D. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; **2010**.
- E. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; **2009**.
- F. ICC-ES AC70 - Acceptance Criteria for Fasteners Power-driven into Concrete, Steel and Masonry Elements

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- G. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; **current edition**.
- H. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; **2010**.
- I. NFPA 13R - Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height; National Fire Protection Association; **2010**.
- J. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; **current edition**.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene **<<one; or ____>>** week before starting work of this section.

1.05 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.
 - 3. Submit **<<shop drawings; product data; and hydraulic calculations>>** to **<<authority having jurisdiction; and Fire Marshall>>** for approval. Submit proof of approval to **Architect**.
- D. Samples: Submit **<<two; or ____>>** of each style of sprinkler specified.
- E. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
- F. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds **<<specified requirements and; or None - N/A>>** code requirements.
- G. 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.
- H. Maintenance Materials: Furnish the following for **Owner's** use in maintenance of project.
 - 1. See Section **01 6000** - Product Requirements, for additional provisions.
 - 2. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
 - 3. Sprinkler Wrenches: For each sprinkler type.

1.06 QUALITY ASSURANCE

- A. Maintain one copy of referenced design and installation standard on site.
- B. Conform to **<<UL; FM; or ITS (Warnock Hersey)>>** requirements.

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- C. Designer Qualifications: Design system under direct supervision of a <<**Professional Engineer; Professional Fire Protection Engineer; or _____**>> experienced in design of this type of work and licensed in **the State in which the Project is located**.
- D. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum <<**three; or _____**>> years <<**documented; or None - N/A**>> experience.
- E. Installers:
1. _____.
 2. _____.
 3. _____.
- F. Installer Qualifications: Company specializing in performing the work of this section <<**with minimum _____ years experience; documented experience; or None - N/A**>> <<**approved by manufacturer; or None - N/A**>>.
- G. Equipment and Components: Provide products that bear <<**UL; FM; or ITS (Warnock Hersey)**>> label or marking.
- H. Products Requiring Electrical Connection: Listed and classified by <<**Underwriters Laboratories Inc.,; or testing firm acceptable to the authority having jurisdiction**>> as suitable for the purpose specified and indicated.

1.07 MOCK-UP

- A. Provide components for installation in mock-up.
- B. Mock-up <<**may not; or may**>> remain as part of the Work.

1.08 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

2.01 MANUFACTURERS

- A. Sprinklers, Valves, and Equipment:
1. _____.
 2. _____.
 3. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.

2.02 SPRINKLER SYSTEM

- A. Sprinkler System: Provide coverage for <<**entire building; building areas noted; building areas noted in Schedule; or _____**>>.
- B. Occupancy: <<**Light hazard; comply with NFPA 13; Ordinary hazard, Group 1; comply with NFPA 13; Ordinary hazard, Group 2; comply with NFPA 13; Ordinary hazard, Group 3; comply with NFPA 13; Extra hazard; comply with NFPA 13; Residential; comply with NFPA 13R; or _____**>>.
- C. Water Supply: Determine volume and pressure from water flow test data.
1. If test data is not available assume _____ **gpm** (_____ **L/s**) at _____ **psig** (_____ **kPa**).

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2. Revise design when test data available prior to submittals.
- D. Interface system with **<<building control system; building fire and smoke alarm system; or _____>>**.
- E. Provide fire department connections **<<where indicated; or _____>>**.
- F. Storage Cabinet for Spare Sprinklers and Tools: Steel, **<<located adjacent to alarm valve; in location designated; or _____>>**.
- G. Pipe Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
 1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
 2. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
 3. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
 4. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
 5. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
 6. Powder Actuated Anchors: Complying with ICC-ES AC70.
 7. Gas Actuated Anchors: Complying with ICC-ES AC70.
 8. Other Types: As required.
 9. Manufacturers:
 - a. Powers Fasteners, Inc: www.powers.com.
 - b. _____.
 - c. _____.
 - d. Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.

2.03 SPRINKLERS

- A. Suspended Ceiling Type: **<<Semi-recessed; Recessed; Concealed; or _____>>**
<<pendant; upright; or _____>> type with matching **<<push on; clamp on; or screw on>>**
<<escutcheon; cover; or _____>> plate.
 1. Response Type: **<<Quick; Standard; or _____>>**.
 2. Coverage Type: **<<Standard; Extended; or _____>>**.
 3. Finish: **<<Brass.; Chrome plated.; Enamel, color _____.; Enamel, color as selected.; Polyester wax; Teflon; Wax; or _____>>**
 4. **<<Escutcheon; Cover; or _____>>** Plate Finish: **<<Antique Brass; Antique Copper; Brass.; Brushed Brass; Brushed Chrome; Brushed Copper; Chrome plated.; Enamel, color _____.; Enamel, color as selected.; or _____>>**
 5. Fusible Link: **<<Fusible solder link type; or Glass bulb type>>** temperature rated for specific area hazard.
 6. Product: _____.
 - a. Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.
- B. Exposed Area Type: **<<Pendant; Standard; or _____>>** upright type **<<with guard; or None - N/A>>**.

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1. Response Type: <<**Quick; Standard; or _____**>>.
 2. Coverage Type: <<**Standard; Extended; or _____**>>.
 3. Finish: <<**Brass.; Chrome plated.; Enamel, color _____.; or Enamel, color as selected.**>>
 4. Fusible Link: <<**Fusible solder link type; or Glass bulb type**>> temperature rated for specific area hazard.
 5. Product: _____.
 - a. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- C. Sidewall Type: <<**Semi-recessed; Recessed; or _____**>> horizontal sidewall type with matching <<**push on; clamp on; or screw on**>> escutcheon plate.
1. Response Type: <<**Quick; Standard; or _____**>>.
 2. Coverage Type: <<**Standard; Extended; or _____**>>.
 3. Finish: <<**Brass.; Chrome plated.; Enamel, color _____.; Enamel, color as selected.; Polyester Wax; Teflon; Wax; or _____**>>
 4. Escutcheon Plate Finish: <<**Brass.; Brushed Brass; Brushed Chrome; Brushed Copper; Chrome plated.; Enamel, color _____.; Enamel, color as selected.; or _____**>>
 5. Fusible Link: <<**Fusible solder link type; or Glass bulb type**>> temperature rated for specific area hazard.
 6. Product: _____.
 - a. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- D. Dry Sprinklers: <<**Concealed; Exposed; Plain barrel; Recessed; or _____**>> pendant type with matching push on <<**estucheon plate; cover plate; or _____**>>.
1. Response Type: <<**Quick; Standard; or _____**>>.
 2. Coverage Type: <<**Standard; Extended; or _____**>>.
 3. Finish: <<**Brass.; Chrome plated.; Enamel, color _____.; or Enamel, color as selected.**>>
 4. <<**Cover; Escutcheon; or _____**>> Plate Finish: <<**Brass.; Brushed Brass; Brushed Chrome; Brushed Copper; Chrome plated.; Enamel, color _____.; Enamel, color as selected.; or _____**>>
 5. Fusible Link: <<**Fusible solder link type; or Glass bulb type**>> temperature rated for specific area hazard.
 6. Product: _____.
 - a. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- E. Residential Sprinklers: <<**Concealed; Recessed; Semi-recessed; or _____**>> <<**upright; pendant; sidewall; or _____**>> type with matching push on <<**estucheon plate; cover plate; or _____**>>.
1. Response Type: <<**Quick; Standard; or _____**>>.
 2. Finish: <<**Brass.; Chrome plated.; Enamel, color _____.; or Enamel, color as selected.**>>

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3. <<**Cover; Escutcheon; or _____**>> Plate Finish: <<**Antique Brass; Antique Copper; Brass.; Brushed Brass; Brushed Chrome; Brushed Copper; Chrome plated.; Enamel, color _____.; Enamel, color as selected.; or _____**>>
 4. Fusible Link: <<**Fusible solder link type; or Glass bulb type**>> temperature rated for specific area hazard.
 5. Product: _____.
 - a. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
 - F. Storage Sprinklers: <<**Concealed; Recessed; Semi-recessed; or _____**>> <<**upright; pendant; or _____**>> type <<**with; or without**>> <<**guard; shield; or _____**>>.ol style="list-style-type: none;"> - 1. Response Type: <<**Standard; or _____**>>.
 - 2. Finish: <<**Chrome plated.; Enamel, color _____.; Enamel, color as selected.; or _____**>>
 - 3. <<**Shield; Guard; or _____**>> Finish: <<**Chrome; Brass; or _____**>>.
 - 4. Fusible Link: <<**Fusible solder link type; or Glass bulb type**>> temperature rated for specific area hazard.
 - 5. Product: _____.
 - a. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.
- G. Guards: Finish to match sprinkler finish.
- H. Spray Nozzles: Brass with solid cone discharge, <<**30; 60; 90; 120; or 140**>> degrees of arc <<**with blow-off dust cap; or None - N/A**>>.ol style="list-style-type: none;">- 1. Finish: <<**Brass; Nickel; _____; or Enamel, color as selected.**>>.
- 2. Product: _____.
 - a. Substitutions: <<**See Section 01 6000 - Product Requirements; or Not permitted**>>.

2.04 PIPING SPECIALTIES

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm <<**and electric alarm; or None - N/A**>>, with pressure retard chamber and variable pressure trim <<**; with test and drain valve; or None - N/A**>>.
- B. Dry Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm <<**and electric alarm; or None - N/A**>>, with accelerator <<**; with test and drain valve; or None - N/A**>>.
- C. Flooding Deluge Valve: Gate type valve with rubber faced disc actuated <<**manually; pneumatically; electrically; or hydraulically**>> with water motor alarm <<**and electric alarm; or None - N/A**>>, with alarm testing trim.
- D. Water Motor Alarm: Hydraulically operated impeller type alarm with aluminum alloy <<**chrome plated; red enameled; or _____**>> gong and motor housing, nylon bearings, and inlet strainer.
- E. Electric Alarm: Electrically operated <<**chrome plated; red enameled; or _____**>> gong with pressure alarm switch.
- F. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated <<**10; or _____**>> amp at 125 volt AC and <<**2.5; or _____**>> amp at 24 volt DC.

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G. Residential Domestic Shut-Off Valve: NFPA 13R, bronze and stainless steel construction, with sprinkler check valve assembly and poppet assembly to divert water from domestic system.

H. Fire Department Connections:

1. Type: **<<Flush mounted wall type with brass finish.; Flush mounted wall type with chrome plated finish.; Free standing type with ductile iron pedestal brass finish.; Free standing type with ductile iron pedestal chrome plated finish.; or Free standing type with ductile iron pedestal red enamel finish.>>**
2. Outlets: **<<Two; or _____>>** way with thread size to suit fire department hardware; threaded dust cap and chain of matching material and finish.
3. Drain: **<<3/4 inch (19 mm); _____ inch (_____ mm)>>** automatic drip, **<<outside; or connected to drain>>**.
4. Label: "Sprinkler - Fire Department Connection".

I. Supervisory Switches: As manufactured by _____ Model _____.

J. Water Level Supervisory Switches: As manufactured by _____ Model _____.

K. Tank Temperature Supervisory Switches: As manufactured by _____ Model _____.

L. Room Temperature Supervisory Switches: As manufactured by _____ Model _____.

2.05 PRESSURE MAINTENANCE PUMP

A. Manufacturers:

1. _____ **<< Product _____; or None - N/A>>**.
2. _____ **<< Product _____; or None - N/A>>**.
3. _____ **<< Product _____; or None - N/A>>**.
4. Substitutions: **<<See Section 01 6000 - Product Requirements; or Not permitted>>**.

B. Type: Close coupled motor and positive displacement pump unit.

C. Construction: Bronze with stainless steel shafts, carbon bearings.

D. Performance: _____ **psi** (_____ **kPa**) differential pressure.

E. Motor: Open drip proof, permanently lubricated.

F. Electrical Characteristics:

1. **<<0.33; 0.5; or _____>>** hp.
2. 115 volts, single phase, 60 Hz.

G. Accessories: Include **<<flexible hose connections; inlet strainer; relief valve; and steel mounting plate>>**.

H. Operation: **<<Manual; or Automatic with pressure switch actuation>>**.

2.06 AIR COMPRESSOR

A. Manufacturers:

1. _____ **<< Product _____; or None - N/A>>**.
2. _____ **<< Product _____; or None - N/A>>**.

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3. _____ <<*Product* _____; or *None - N/A*>>.
4. Substitutions: <<*See Section 01 6000 - Product Requirements; or Not permitted*>>.
- B. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve.
- C. Electrical Characteristics:
 1. <<*1/3; 3/4; 1-1/2; or* _____>> hp.
 2. 125 volts, single phase, 60 Hz.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Install buried shut-off valves in valve box. Provide post indicator.
- D. Provide approved <<*double check valve; backflow preventer; or* _____>> assembly at sprinkler system water source connection.
- E. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
- F. Locate outside alarm gong on building wall <<*as indicated; or* _____>>.
- G. Place pipe runs to minimize obstruction to other work.
- H. Place piping in concealed spaces above finished ceilings.
- I. Center sprinklers in <<*two directions in ceiling tile and provide piping offsets as required; one direction only in ceiling tile with location in other direction variable, dependent upon spacing and coordination with ceiling elements; or* _____>>.
- J. 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.; or None - N/A*>>
- K. Install and connect to fire pump system in accordance with <<*Section 21 3000; NFPA 13; NFPA 13R; or* _____>>.
- L. Install air compressor on vibration isolators. Refer to Section **22 0548**.
- M. Install air compressor on vibration isolators. Refer to Section **21 0548**.
- N. Flush entire piping system of foreign matter.
- O. Install guards on sprinklers <<*where indicated; or* _____>>.
- P. Hydrostatically test entire system.
- Q. Require test be witnessed by <<*Fire Marshal; authority having jurisdiction; and* _____>>.

3.02 INTERFACE WITH OTHER PRODUCTS

- A. Ensure required devices are installed and connected as required to fire alarm system.

3.03 SCHEDULES

- A. System Hazard Areas:

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1. Offices: Light Hazard.
2. Warehouse: Ordinary Hazard, Group 2.
3. Computer Room: Light Hazard, Pre-action.

B. Sprinklers:

1. Drawing Code:
2. Manufacturer:
3. Model:
4. Location:
5. Temperature Rating:
6. Finish:
7. Style:

END OF SECTION