

SECTION 13900
FIRE SUPPRESSION

PART 1 GENERAL

1.1 SCOPE

- A. The work under this section of the specifications consists of furnishing all materials, equipment, labor, testing, appurtenances, engineering and performing all operations in conjunction with all fire protection work indicated on drawings and specified herein.
- B. This is a performance base specification with the Sprinkler Contractor providing professional design services of an Engineer. The information in this Section of the DMS is intended solely to set forth the minimum engineering, material and installation requirements to be used as basic prerequisites applied to the work in this Section.

1.2 RELATED DOCUMENTS

- A. The other Contract Documents complement the requirements of this Section. The General Requirements apply to the work of this Section.

1.3 CODES AND REGULATIONS

- A. Sprinkler system design, equipment, materials, devices and installation shall conform to NFPA Codes and Requirements of Governmental Bodies and Bureaus as listed below.
 1. NFPA-13, 14, 20, and 24
 2. The City of Melbourne Code Compliance Division Melbourne Fire Department.
 3. Underwriters Laboratory
 4. Factory Mutual
 5. Department of Professional Regulation, State of Florida, Law and Rules, Chapter 471, Florida Statutes and Rules Chapter 61G15, Florida Administrative Code.
 6. FBC Florida Building Code

1.4 SUBMITTALS

- A. Prior to commencing the work, the Sprinkler Contractor shall submit a complete set of detailed signed and sealed working drawings prepared by an Engineer in accordance with NFPA-13, showing equipment, underground fire service lines, risers, piping and heads. These drawings shall be coordinated with structural steel, mechanical ductwork and piping shop drawings prior to submission. Drawings shall indicate cut length of piping, elevation of lines, location of piping from columns and/or other fixed building elements. If using grooved couplings, show joint coupling and fittings on drawings and product submittals, specially identified with the applicable manufacturer' style number.
- B. The Engineer shall prepare and submit a complete set of signed and sealed hydraulic calculations for each riser. Where risers serve areas with different hazard classifications, provide a separate calculation for each hazard. Provide graph sheets with plotted water supply curve, sprinkler system demand curve and hose demand.
- C. Sprinkler drawings shall be coordinated with the mechanical and electrical, and the Project Consultant's reflective ceiling plans. Because the drops for sprinkler heads are installed prior to the lighting, ductwork and air outlets, the Sprinkler Contractor shall locate the heads to avoid interference with such items. Locations for mechanical and electrical items shall have priority

1.8 SCOPE

- A. The entire facility shall be fully sprinklered with head spacing and locations in accordance with NFPA-13 including equipment rooms, closets, and similar locations.

1.9 DESIGN CRITERIA

- A. The sprinkler system shall be hydraulically designed.
- B. If the project is to be constructed in phases, the sprinkler system shall be sized to serve completed and future phases.
- C. The general sprinkler system design parameters are as follows:
 - 1. Administrative and Classrooms: Light hazard occupancy, minimum application density of 0.10 gpm/sq.ft. over 1500 square feet.
 - 2. Kitchen/Food Service Area: Ordinary Hazard, Group I, minimum application density of 0.15 gpm/sq.ft. over 1500 square feet.
 - 3. Stage Area: Ordinary Hazard, Group II, minimum application density of 0.20 gpm/sq.ft. over 1500 square feet. In addition to the sprinkler system, a Class III standpipe system shall be provided at the stage where required by NFPA-101.
- D. Hose: 100 gpm for light hazard, 250 gpm for ordinary hazard.
- E. Coverage: maximum 225 square feet per head for light hazard areas, maximum 130 square feet per head for ordi

- G. Mechanical Couplings: UL listed and FM Global approved for fire protection service, ductile or iron housing, rust inhibiting no-lead painted coating, zinc electroplated heat treated bolts and heavy hex carbon steel nuts meeting ASTM A-449 equal to Grinnell, Starr or Victaulic.
1. Rigid Type: To provide system rigidity, use coupling housings cast with offsetting, angle-pattern bolt pads, support and hang in accordance with NFPA 13, Victaulic 005 or 07.
 2. Flexible Type: Use in locations where vibration attenuation and stress relief are required. May use flexible couplings in lieu of flexible connectors at equipment connections. Place

encapsulated ductile iron disc, stainless steel spring and shaft, grooved ends. Provide automatic drip valve where required for drainage.

H. Gong alarm bell, 24 volt operation, 10 inch diameter weatherproof cast aluminum housing with steel gong, painted red with identification sign.

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1. The fire pump controller shall meet NFPA 20 and NFPA 70 requirements for fire pump service and are UL listed.
2. The fire pump controller/automatic transfer switch shall be of the combined automatic and manual reduced voltage, soft-start, solid-state, full wave controlled open loop type.
3. The fire pump controller shall have a single handle for operating both the isolating switch and then the solid-state microprocessor-type circuit breaker in sequence. Provide a reduced voltage, soft-start, solid-state NEMA rated starter sized for the motor load. Controls to be furnished shall include a built-in 10-300 psi bourdon tube-type pressure switch with independent high and low setpoints piped to the cabinet exterior, automatic and manual start and manual soft stop and emergency stop pushbuttons, an adjustable minimum run timer, power available light, and power monitoring sensing all phases for loss of any phase, under voltage, or phase reversal. Fire pump controller shall provide three (3) signals to the facility fire alarm control panel per NFPA 20 and NFPA 72. Provide dry contacts for signaling loss of input power; phase reversal; pump running; and provide contacts for remote start. Provide voltage surge arresters between each line terminal of the controller isolating switch and ground, to suppress voltage surges above rated motor voltage tolerance. The reduced voltage acceleration ramp shall be adjustable between 0.5 and 10 seconds, with a bypass contactor to energize at full speed or upon overheating of the solid-state starter. Stop sequence shall also be initiated through the solid-state starter and include an adjustable deceleration ramp. All indicated controls and a dry-type control transformer shall be housed in steel NEMA 2 enclosure with lockable handle, and shall be factory assembled and tested prior to shipment.
4. The automatic transfer switch shall withstand current rating of at least 22,000 RMS symmetrical Amps and be capable of manual mechanical operation by means of a readily accessible handle. It shall provide for transfer of the soft/start controller to an emergency power source upon failure of the normal power source and return to the normal power when power is restored. The transfer switch shall be electrically operated and mechanically held, and listed by U.L. for fire pump service.
5. The controller assembly shall be rated to withstand the maximum available fault current of the normal and emergency isolating switches. Voltage and horsepower rating shall be as scheduled.
6. An audible alarm shall be provided.
7. A safety mechanical link shall be provided between the emergency isolating switch and the normal isolating switch to mechanically open the emergency isolating switch when the normal isolating switch is opened. It shall also have a safety interlock to prevent the isolating switch from being either opened or closed when the circuit breaker is closed. Visual indication of the switch position shall be provided.
8. Controller shall be service entrance labeled by U.L.
9. Provide remote alarm panel for 120 volt input with power on light, pump run light, pump power failure light, remote fire pump start switch, press-to-test switches, audible alarm with alarm silence.

2.3 SPRINKLER HEADS

- A. Sprinkler heads shall be UL listed, FM Global approved, and from a single manufacturer, equal to Grinnell, Star, Viking, Reliable Central or Victaulic of the following types:
 1. Sprinkler heads shall be of the ordinary temperature range, 155°F, except where subject to high temperatures caused by unit heaters, hot pipes, radiant ceiling, or other heat source, heads shall be of high temperature type, 250°F.

2. For areas with finished ceilings: heads shall be of

- A. Provide services of the Licensed Professional Engineer in the State of Florida to design a complete wet pipe sprinkler system in accordance with NFPA-13, NFPA-24 and other applicable code requirements.
- B. Engineer shall provide signed and sealed engineering documents suitable for fabrication including cut lengths of pipe.
- C. Engineer shall provide signed and sealed hydraulic calculations for each riser and for each hazard classification.

3.2 INSTALLATION

- A. Install new fire service line and sprinkler system generally as indicated and coordinate with work of other trades. Exact requirements and installation shall be in accordance with working shop drawings.
- B. Hydrostatically pressure test above ground piping for two hours at pressure as required by NFPA-13 and 14, with no observable leakage allowed. Pressure test below ground piping in accordance with NFPA-24, with leakage not to exceed that allowed by NFPA-24.
- C. Label drain piping, inspectors test stations, main drain, electric gong and similar system

5. Factory trained representative shall periodically inspect the product installation.
 6. Contractor shall remove and replace any improperly installed products.
 7. Pipe shall be certified for use with the manufacturer's system.
- N. Locking Lug Joints:
1. Pipe ends shall be square cut and thoroughly clean on the outside edge for 1" from the pipe end to remove pipe coatings, mill scale, rust and raised weld beads.
 2. Remove all burrs and sharp edges on the pipe inside and outside edge.
 3. Pipe shall be marked 1 ½" from the end and pipe end configuration shall be in conformance with manufacturer's specifications.

END OF SECTION