SECTION 21 13 13 - FIRE SUPPRESSION (DESIGN BUILD)

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Section 23 05 00 "Common Work Results For Mechanical” apply to the work of this section.

1.2 DESCRIPTION

A. The work under this section of the specifications includes labor, material and equipment to furnish and install new automatic sprinkler and standpipe systems tested and ready for use in accordance with local Fire Department requirements.

B. For heated areas with temperature maintained above 40°F, furnish and install automatic wet fire protection, systems including piping, fittings, sprinkler heads, OS and Y valves with supervisory contact units, electric alarm devices, pressure and flow switches, drains and appurtenances.

C. For outside areas and other non heated areas where temperature cannot be maintained at or above 40°F, Dry systems with Upright and/or Dry pendants shall be used. Dry Sprinkler system shall be installed per NFPA 13, Section 7.2, 2007 Edition.

D. Pay for permits, fees and charges for testing and inspecting the entire sprinkler systems as required for complete and fully automatic operating systems.

E. Design Criteria: The design and installation of Fire Protection Systems shall be complete with necessary accessories for proper operation and shall be accomplished by the Contractor in accordance with requirements of the Office of Statewide Health Planning and Development, NFPA 13, 2007 edition and local Kern County Fire Department requirements.

1. Refer to drawings for additional system criteria.

2. Layout design and hydraulic calculations.

3. OSHPD approved shop drawings and calculations for complete systems.

4. Equipment and appurtenances.

5. Pipe, valves, fittings and hangers.


7. Operating instructions.

8. Identification.

9. Flushing and testing.
F. Coordinate with Civil points of connection, backflow requirements, post indicator valve, fire department pumper connection and sectional valve locations.

G. Coordinate with Electrical tamper switches, flow switches, bells and/or horn/strobes, alarms and electrical signaling requirements.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Comply with all pertinent recommendations contained in:
   1. 2010 California Building and Fire Codes including amendments

B. Materials and Equipment:
   1. Materials and equipment used for the installation of the sprinkler system shall be new and listed by the UL Fire Protection Equipment List or the FM Approval Guide and shall be the standard product and the latest design of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of the same manufacturer.
   2. Where provisions of pertinent codes and standards conflict with this specification, the more stringent provisions shall govern.

1.4 SUBMITTALS

A. General: Comply with provisions of Section 23 05 00 "Common Work Results For Mechanical.

B. Integrated Shop Drawings: Coordinate and provide shop drawings submittal in accordance with Section 23 05 00 "Common Work Results For Mechanical.

C. Installation Shop Drawings: Submit shop drawings for approval prior to fabrication of any component of the system as follows:
   1. Shop drawings shall consist of and six drawings prepared electronically using AutoCad 2012 or later and six sets of hydraulic calculations of sprinkler systems. Provide piping layout which shall include Fire riser and mains, cross mains, branch lines, sprinklers and controls.
   2. Before proceeding with construction work, Contractor's Fire protection shop drawing shall
be approved by the Architect, State Fire Marshal, City of Victorville, San Bernardino County Fire Department, and DSA.

3. The Contractor shall first submit Fire protection design drawings and calculations to the Architect for his review and, after corrections are completed, Contractor shall submit to the State Fire Marshal, City of Victorville, San Bernardino County Fire Department, and DSA for their approvals.

4. Revisions to the Contractor's working drawings during construction, or after the above approval, shall be identified on the drawings, approved by the agencies specified above, and resubmitted to the Architect for his review before proceeding with the work.

5. After construction work has been completed and approved by the agencies having jurisdiction, the Contractor shall furnish computations and drawings prepared electronically using AutoCAD 2012 or later to the Architect for record purposes, showing the final installation in detail.

D. Submittal Data: The submittal data to be furnished at the same time with shop drawings shall include, but not be limited to, the following:

1. Valves
2. Sprinklers
3. Pipe and fillings, hangers, supports
4. Other Equipment

1.5 PRODUCT HANDLING

A. Protection: Protect the materials of this section before, during, and after installation and to protect the work and materials of all other trades.

B. Replacements: In the event of damage, immediately make repairs and replacements necessary and at no additional cost to the Owner.

1.6 OPERATING INSTRUCTIONS

A. The Contractor shall finish three copies of completed set of typed or printed maintenance and operating instructions, for the entire system.

PART 2 - PRODUCTS

2.1 PIPES AND FITTINGS

A. Exterior Underground Piping:

a. Fittings: Cast Iron Flanged, ASA B16.1 Class 125; bell and spigot ASA 21.10; fittings to be cement mortar lined ASA21.4.


4. Gate Valves: AWWA C500-59T.

5. Indicator Posts: UL and FM approved upright post for non-rising stem indicator post style gate valves. No. A-20805, with tamper switch (double contact), by Mueller.

B. Aboveground Piping:

1. 2-1/2-inch and larger: Schedule 10 black steel pipe manufactured in accordance with ASTM A-53, joined by 300-psig welding or roll grooved fittings.

2. 2-inch and smaller: Black steel Schedule 40 manufactured in accordance with ASTM A-53 with 300-psig threaded malleable iron fittings.

3. Flanged welding fittings shall be neck type. Fittings welded, screwed or grooved rated for 200-psig working pressure and approved by UL.

C. Drain Piping: Schedule 40 galvanized steel pipe ASTM A-53 with 150-psig galvanized malleable iron screwed fittings.

D. Non-grooved couplings or fittings, utilizing gaskets and locking lugs will not be acceptable.

2.2 DOUBLE DETECTOR BACKFLOW PREVENTER

A. Products which may be incorporated in the Work include the following:

  2. Watts Regulator Company.
  3. Wilkins Regulator Division, Zurn Industries, Incorporated.

B. Reduced-Pressure Detector Assembly Backflow Preventer: UL 312 and ASSE 1047, consisting of OS&Y gate valves on inlet and outlet, and strainer on inlet, with pressure-differential relief valve with ASME A112.1.2 air-gap fitting between two positive-seating check valves and test cocks, and bypass with displacement-type water meter, valves, and reduced-pressure backflow preventer.

2.3 VALVES

A. Valves shall be UL listed and designed for a working pressure of 175-psig.
B. Gate valves flanged OS&Y unless otherwise indicated.

C. Butterfly Valves: Indicating type with crank operator UL listed. Pratt IBV, Demco, Grinnell, or equal.

D. Check Valves: Flanged, iron body, bronze mounted, bolted cap, renewable seat and disc.

E. Globe or Angle Valves
   1. Products which may be incorporated in the Work include the following:
      a. Viking Sprinkler Corporation.
      b. Nibco, Incorporated.
      c. United Brass
      d. Kennedy Valves.
   2. 2-inch and smaller: Bronze body, bronze trim, rising stem and hand wheel, inside screw, renewable composition disc, solder or screwed ends, with back seating capacity.
   3. 2-1.2-inch and larger: Iron body, bronze trim, rising stem, hand wheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

F. Butterfly Valves
   1. Products which may be incorporated in the Work include the following:
      a. Viking Sprinkler Corporation.
      b. Kennedy Valves.
      c. Nibco, Incorporated.
   2. Cast or ductile iron body; chrome plated ductile iron disc, resilient replaceable EPDM seat; wafer, lug, or grooved ends; extended neck; hand wheel and gear drive and integral indicating device; built-in tamper proof switch.

G. Drain Valves
   1. Manufacturers: Subject to compliance with project requirements, manufacturer's offering Products which may be incorporated in the Work include the following:
      a. Viking Sprinkler Corporation.
      b. United Brass
      c. Nibco, Incorporated.
   2. Bronze compression stop with hose thread, nipple and cap. Use hose thread, nipple and cap
only where piping to outside or other approved drainage facility is not readily available.

4. Use hose thread, nipple and cap.

2.4 WET SYSTEM RISER CHECK VALVES

A. The riser check valve shall be UL Listed and FM Approved. The riser check valve shall be equipped with a removable cover assembly. The riser check valve shall be listed for installation in the vertical or horizontal position. The riser check valve shall be equipped with gauge connections on the system side and supply side of the valve clapper.

B. The riser check valve shall be equipped with a main drain outlet in the body of the valve above the rubber faced clapper assembly.

C. The riser check valve trim piping to be externally galvanized.

D. Maximum water working pressure to 250-psig

E. The Riser Check Valve manufacturer to be The Viking Corporation. The Check Valve to be a Viking Easy Riser Swing Check Valve, Model E-1 or F-1.

2.5 PRESSURE GAUGE

A. Shall be UL listed, 0-250-psig bourdon spring type with 3-1/2-inch diameter dials, calibration screws, and shut off cocks. Brass case construction.

2.6 SPRINKLERS

A. Sprinkler heads shall be UL and FM approved and to be installed per NFPA 13, 2007 Edition.

B. Fire sprinklers shall be of one manufacturer throughout building. No mixing of sprinkler brands shall be permitted. Sprinklers shall be of brass frame construction with a coated metal-to-metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Sprinklers shall have a quick response frangible bulb type fusible element with a temperature rating of 155 or 200°F or shall have a fast response metal type fusible element with a temperature rating of 165 or 212°F. Sprinklers to be installed in areas with no ceilings shall be of a brass finish and shall be of adequate temperature for the hazard. Exposed sprinklers subject to corrosive atmospheres shall have a factory applied corrosion resistant coating. Sprinklers to be installed through a ceiling shall be a factory painted white finished concealed pendent sprinklers. Sprinklers shall have a 1/2-inch NPT, a standard orifice, and a 5.6 nominal K Factor. Quick response sprinklers shall be listed for installation in Ordinary Hazard occupancy if installed in Ordinary Hazard occupancy. Sprinklers shall be UL and FM Approved for working water pressures up to 175-psig.

C. Sprinklers in Wet System Finished Ceiling Area:

1. Quick Response Concealed Pendent Sprinkler: UL Listed and F.M. Approved for use in Light Hazard occupancies. Concealed sprinklers shall have a chrome finish (or finish as
specified elsewhere) cover plate that is a push-on, thread-off assembly with a 2-3/4-inch diameter. Concealed sprinklers shall have a 1/2-inch NPT, a standard orifice, and a nominal K Factor of 5.6. Quick Response Concealed Pendent Sprinklers shall be Viking SIN VK462.

2. Quick Response Concealed Horizontal Sidewall Sprinkler: Shall be listed for installation in Ordinary Hazard occupancy if installed in Ordinary Hazard occupancy. Concealed horizontal sidewall sprinklers shall have a factory painted white cover plate that is a push-on, pull-off assembly with a 2-3/4-inch diameter. Concealed sprinklers shall have a 1/2-inch NPT, a standard orifice, and a nominal K Factor of 5.6. Quick response horizontal sidewall sprinklers shall be UL listed for Light Hazard and Ordinary Hazard occupancies. Concealed Horizontal Sidewall Sprinklers shall be Viking SIN VK408.

D. Exposed and Above Ceiling Area:

1. Quick Response High Pressure Upright Sprinkler: UL listed and FM approved. Quick response sprinklers shall be listed for installation in Ordinary Hazard occupancy if installed in Ordinary Hazard occupancy. Quick Response Sprinklers shall be Viking SIN VK300 (5.6K Standard Orifice Upright) or SIN VK350 (8.0K Large Orifice Upright).

2. Quick Response High Pressure Pendent Sprinkler: UL listed and FM approved. Quick response sprinklers shall be listed for installation in Ordinary Hazard occupancy if installed in Ordinary Hazard occupancy. Quick Response Sprinklers shall be Viking SIN VK302 (5.6K Standard Orifice Pendent) or SIN VK352 (8.0K Large Orifice Pendent).

E. Dry Sprinkler used in Light Hazard areas as defined by NFPA 13, 2007 Edition:

1. Standard Response Dry Pendent Concealed Sprinkler: Shall have a 5-mm frangible bulb type fusible element. Dry pendent sprinklers shall have a 1-inch NPT and a standard orifice with a nominal K Factor of 5.6 or large orifice with a nominal K Factor between 6.8 and 8.0, depending on the length. The installation of dry pendent sprinklers shall be in conformance with the manufacturer’s installation guidelines. The dry pendent sprinklers shall have a chrome finish (or finish as specified elsewhere). The concealed pendent sprinkler shall be installed with an adapter and a push-on, thread-off cover assembly, with 1/2-inch of adjustment, and a cover diameter no greater than 3-1/8-inch. Concealed pendent sprinklers shall be listed for installation in Ordinary Hazard occupancy if installed in Ordinary Hazard occupancy. Cover plates shall be chrome finish (or finish as specified elsewhere). Dry pendent sprinklers shall be UL Listed or FM Approved. Dry Pendent Sprinklers (formerly Model M) are to be Viking Dry Pendent SIN VK190 (Standard Orifice) or SIN VK192 (Large Orifice).

2. Quick Response Concealed Dry Pendent Sprinkler: Shall be UL listed and FM approved. Quick response sprinklers are thermo-sensitive spray sprinklers suitable for use in areas subject to freezing. The glass-bulb fluid temperature rated to -65°F. Quick Response Dry Sprinklers (adjustable recessed) shall be Viking SIN VK180 or SIN VK181 (Large Orifice).

3. Quick Response Concealed Horizontal Sidewall Dry Sprinkler: Shall be UL listed and FM approved. Quick response sprinklers are thermo-sensitive spray sprinklers suitable for use in areas subject to freezing. The glass-bulb fluid temperature rated to -65°F. Quick
Response Dry Sprinklers (adjustable recessed) shall be Viking SIN VK279.

4. Quick Response Brass Upright Sprinkler: Shall have a standard or large orifice and a 5.6 or 8.0 nominal K Factor. Sprinklers shall be UL Listed or FM Approved. Quick response sprinklers shall be listed for installation in Ordinary Hazard occupancy if installed in Ordinary Hazard occupancy. Quick Response Sprinklers (formerly Model M) shall be Viking SIN VK302 (5.6K Standard Orifice Pendent) or SIN VK352 (8.0K Large Orifice Pendent). Or, SIN VK300 (5.6K Standard Orifice Upright), or SIN VK350 (8.0K Large Orifice Upright).

F. Dry Sprinkler used in Ordinary Hazard areas as defined by NFPA 13, 2007 Edition:

1. Standard response dry pendent sprinklers shall have a 5-mm frangible bulb type fusible element. Dry pendent sprinklers shall have a 1-inch NPT and a standard orifice with a nominal K Factor of 5.6 or large orifice with a nominal K Factor between 6.8 and 8.0, depending on the length. The installation of dry pendent sprinklers shall be in conformance with the manufacturer’s installation guidelines. The dry pendent sprinklers shall have a chrome finish (or finish as specified elsewhere). The concealed pendent sprinkler shall be installed with an adapter and a push-on, pull-off cover assembly, with 1/2-inch of adjustment, and a cover diameter no greater than 3-1/8-inch. Concealed pendent sprinklers shall be listed for installation in Ordinary Hazard occupancy if installed in Ordinary Hazard occupancy. Cover plates shall be chrome finish (or finish as specified elsewhere). Dry pendent sprinklers shall be UL Listed or FM Approved. Dry Pendent Sprinklers (formerly Model M) are to be Viking Dry Pendent SIN VK190 (Standard Orifice) or SIN VK192 (Large Orifice).

G. Temperature rating of sprinklers shall be as required by NFPA 13 in accordance with the maximum ceiling temperature.

H. Provide approved guards for sprinklers in low ceilings below ducts, beams, or other heads less than 7-foot above a finished floor.

I. Recessed escutcheon concealed cover plates shall be shall be listed with sprinkler head being used and shall have white finish or finish as specified on plans. Recessed escutcheons shall be a Viking Model “E-1 or F-1” recessed escutcheon.

J. Spare Heads: Provide a sprinkler cabinet containing a reserve supply of no less than six sprinklers of each type and two wrenches necessary for installing them. Install where approved by the Owner’s Representative.

2.7 SLEEVES AND ESCUTCHEONS

A. Sleeves through structural concrete members and sleeves for walls below grade and floors on grade shall be standard weight galvanized Schedule 40 steel pipe. Sleeves through other than structural components of the building shall be 20-gage galvanized sheet metal with lock seam joints. Sleeve shall extend two inches past finished surface. Safing insulation shall be installed between sleeve and pipe.

B. Pipe escutcheon plates to be installed where exposed piping passes through walls, ceilings, and
floors of building shall be minimum 20-gage steel.

2.8 ACCESSORIES

A. Hangers and Supports: Provide hangers and supports as required by NFPA 13. Provide seismic bracing in accordance with NFPA 13, as required by state and local codes.

B. Flushing Connections: Provide threaded, capped nipple or mechanical groove end cap on ends of cross mains. If nipple provided, diameter shall be same as pipe, but not larger than 2-inch.

C. Auxiliary Drains:
   1. 5-gallon or greater: provide minimum 1-inch globe valve with hose adapter and cap.
   2. Less than 5-gallon: provide minimum 1-inch nipple and cap.
   3. Auxiliary drain facilities shall be placed to allow easy access.

D. If piping or components of Inspector’s test connection are modified as a result of this Work, then provide as required by Contractor.

E. If inspector test valve and auxiliary drain valve are piped together then test drain assembly shall be an approved manufactured assembled unit. Subject to compliance with requirements, provide valves of one of the following manufacturers:
   1. “Test Drain”, by Viking

F. Alarm
   1. Electric Bell: Provide 10-inch diameter electric bell on exterior of building adjacent to sprinkler riser.

G. Wet Sprinkler System Water Flow Detectors: Equip sprinkler system risers with double pole vane type flow detector, Model No. VSR-F by Potter or Viking. Set adjustable delayed signal at 30 seconds. Connect to fire alarm system.

H. Control Valve Supervisory Switches or Tamper Switches:
   1. Equip post indicator valves with tamper switches, Model No. PCVS, as manufactured by Potter Electric Signal of St. Louis, Missouri. Connect to fire alarm system.
   2. Equip outside screw and yoke valves with tamper switches, Model No. OSYSU-A2 as manufactured by Potter Electric Signal of St. Louis, Missouri. Connect to fire alarm system.
   3. Valves capable of controlling water supply shall have tamper switches. Connect to fire alarm system.
I. Fire Department Connections: Fire Department connections in accordance with NFPA 13 and NFPA 14. Equip with threads/connections compatible with hoses utilized by the local fire department.

1. Drain: 3/4-inch automatic drip, piped to approved drainage location.

2. Label: "Combined Standpipe".


J. Sprinkler Head Guards: Shall be listed with sprinkler head be utilized. Head guard shall be a Viking Model D-1.

1. Provide sprinkler guards on sprinkler pendants that are located below 8 feet above finished floor, except at semi-recessed sprinklers.

2.9 WET PIPE FIRE SPRINKLER SYSTEMS

A. Wet pipe system shall be provided for heated areas where temperature is maintained above 40˚F:


C. Sprinkler Heads: Refer to Article 2.6.

D. The Wet System Control Valve shall be a listed indicating type valve. Control valve shall be UL Listed and Factory Mutual Approved for fire protection installations. The system control valve shall be rated for normal system pressure but in no case less than 175-psig.

E. The Riser Check Valve shall be UL Listed and Factory Mutual Approved. The riser check valve shall be equipped with a removable cover assembly. The riser check valve shall be listed for installation in the vertical or horizontal position. The riser check valve shall be equipped with gauge connections on the system side and supply side of the valve clapper. The riser check valve shall be equipped with a main drain outlet in the body of the valve above the rubber faced clapper assembly. The riser check valve trim piping to be externally galvanized. Maximum water working pressure shall be 250-psig. The Riser Check Valve manufacturer shall be The Viking Corporation Model E-1 or F-1.

F. Water flow switch: Wet type fire sprinkler systems shall be equipped with the means to provide an alarm when a water flow condition exists. This shall be accomplished through the provision of a vane or paddle type water flow switch affixed to the system riser. Water vane type switch shall be labeled as to the correct orientation of flow when mounted on system piping. If drilling of the system riser is necessary to mount flow switch, the drilled out disc shall be retrieved and attached to the mounting u-bolt of the flow switch. The vane type flow switch shall be equipped with an adjustable delay of audible alarm initiation. Adjustment range shall be from 0 to 120-seconds. The Vane Type Water Flow Switch shall be Potter Electric or Viking Model VSR-F or VSR-D.

G. Electric alarm bell: Provide 10-inch diameter electric bell on exterior of building adjacent to sprinkler system combined automatic wet pipe and wet standpipe riser systems.
H. A system fire department connection shall be provided on the system riser in accordance with NFPA 13, Standard for Installation of Sprinkler Systems. The fire department connection shall be of a brass body with an integral clapper assembly to separate flow between inlets. The fire department connection shall be installed in an area accessible for the first response unit. The fire department connection shall be UL Listed and Factory Mutual Approved for fire protection use.

2.10 DRY PIPE FIRE SPRINKLER SYSTEMS

A. Dry pipe systems shall be provided for outside areas and other non-heated areas where temperature cannot be maintained at or above 40°F.


C. System devices:

1. Dry pipe systems shall be equipped with a dry pipe valve. The dry pipe valve shall be a positive latching clapper, differential type dry valve. Dry valve shall be UL Listed and Factory Mutual Approved. Air pressure to water pressure area differential shall be approximately 6 to 1. Dry pipe valve trim shall be galvanized. Dry Pipe Valve manufacturer shall be The Viking Corporation Model F-1.

2. The dry system control valve shall be a listed indicating type valve. The control valve shall be UL Listed and Factory Mutual Approved for fire protection installations. The system control valve shall be rated for normal working pressure but in no case less than 175-psig.

3. Dry sprinklers: Refer to Section 2.6.

4. Drains:

a. Where the capacity of trapped sections of piping is less than 5-gallon, an auxiliary drain consisting of not less than a 1/2-inch valve and plug shall be provided.

b. Where the capacity of trapped sections of piping is more than 5-gallon, a drain consisting of two 1-inch valves and a 2 x 12-inch condensate nipple (drum drip) shall be provided.

5. Compressed air supply:

a. An air supply capable of restoring system pressure within 30-minutes shall be provided. Acceptable air supply arrangements is a tank mounted air compressor with an air maintenance device between the air compressor and the air supply inlet on the system riser.

b. Air compressor shall be tanked mounted as manufactured by General Air Corporation.

6. Air Maintenance Device: Air supplies provided for sprinkler systems shall be equipped with an automatic air pressure maintenance device. Air maintenance device shall be
equipped with a 1/4-inch air supply bypass with a field adjustable air pressure regulator with a built-in ball check valve to eliminate air loss when system is in service. Air maintenance device shall have a factory setting of 40-psig. Air Maintenance Device manufacturer shall be The Viking Corporation Model D-2.

7. Quick Opening Device: The sprinkler system quick opening device shall be a UL Listed and Factory Mutual Approved accelerator with an internal anti-flooding device. Accelerator shall have an air source from a dependable air source regulated through an approved air maintenance device. Accelerator shall be of the same manufacturer as the dry pipe valve or deluge valve and be listed for use together. Accelerator manufacturer to be The Viking Corporation. Accelerator to be Viking Model D-2.

8. Pressure Supervisory Switch: Low air pressure alarm will activate by way of a pressure supervisory alarm pressure switch. The low air pressure alarm switch shall be compatible with system devices. Low air pressure alarm switch enclosure shall be UL Listed and Factory Mutual Approved for the application in which it is used. Low air pressure alarm switch shall have the ability to be wired for Class A or Class B service. Low Air Pressure Alarm Switch shall be Viking, part number 09472 or 09473.

9. Alarm Pressure Switch: Water flow will activate an alarm by way of an alarm pressure switch. The alarm pressure switch shall be compatible with system devices. Alarm pressure enclosure shall be UL Listed and Factory Mutual Approved. Alarm pressure switch shall have the ability to be wired for Class A or Class B service. Alarm Pressure Switch shall be Viking, part number 09470 or 09471.

10. Fire Department Connection: A system fire department connection shall be provided on the system riser in accordance with NFPA 13, Standard for Installation of Sprinkler Systems. Fire department connection shall be of a brass body with an integral clapper assembly to separate flow between inlets. Fire department connection shall be installed in an area accessible for the first response unit. Fire department connection shall be UL Listed and Factory Mutual Approved for fire protection use.

11. System Check Valve: Check valves shall be UL Listed and Factory Mutual Approved for use on fire protection systems. Check valves shall be constructed of a ductile iron body with a brass seat and a rubber faced clapper assembly hinged to a removable access cover. Check valves shall be equipped with a removable access cover for periodic inspection as required in NFPA 25, Standard for Inspection, Testing and Maintenance of Water-Based Fire Protection Systems. Check valves shall have a working water pressure of 250-psig. Check Valve manufacturer to be The Viking Corporation Model D-1 or G-1.

END OF SECTION 21 13 13