PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, specification sections, and general conditions section apply to work of this section.

1.02 SCOPE

A. The Division-15 Contractor responsible for the Automatic Sprinkler and Fire Protection Work for this project shall be herein referenced as the Fire Protection Contractor. The Fire Protection Contractor shall be a registered sprinkler contractor, licensed in the state in which the work is to be done.

B. The scope of this project includes the furnishing of labor, materials, equipment, tools, supervision, and related items for the installation of a complete and operating system of automatic sprinkler and fire protection as outlined in Division-15 specifications and drawings. The work shall in general include, but is not necessarily limited to, the following:

1. New underground fire main for the facility as indicated with connection to public water main.
2 Four inch (6”) plugged tee in new water main for connection of domestic water main by Plumbing Contractor.
3 Fire water booster pump assembly complete with jockey pump, controllers, fittings, valves, etc. If required.
4. Fire hydrants, yard post indicator valves and Siamese pumper connection.
5. Automatic wet and dry sprinkler systems if required, flow switches, valves, hangers, supports and concrete for anchoring for a type V construction wood frame facility.
6. Seismic restraints for fire protection system.
7. Testing of systems and acceptance by local Fire Marshal.

C. Piping from the “point of service” including underground used for sprinkler or standpipe system must be installed by a registered sprinkler contractor. Where underground water mains and hydrants are to be installed, they must be installed, completed and in service prior to any construction work.

1.03 WORK BY OTHERS

A. The following work relating to the work under this division of the specifications will be provided by Others:

1. Owner will furnish and install fire extinguishers.

2. Fire Pump House, if required, will be by general contractor.

1.04 HYDRAULICALLY CALCULATED SYSTEM

A. Fire Protection Contractor shall furnish and install hydraulically designed automatic sprinkler systems, as indicated herein and on the drawings.

B. The hydraulically designed systems shall be based on the following basic design criteria:

1. Area of water application and density shall be as indicated on the sprinkler drawings. Total water quantities shall include hose allowance, as indicated on the drawings.
2. Area per sprinkler shall not exceed code requirements, or requirements shown on the drawings.

C. The calculations shall be based on the approximate water supply information shown on the drawings.

D. Fire Protection Contractor shall be responsible for obtaining actual pressure readings at the job site for designing the hydraulically calculated system.

E. Hydraulic calculations shall be prepared in accordance with the requirements of Chapter 7 of NFPA-13.

1.05 SHOP DRAWINGS AND HYDRAULIC CALCULATIONS

A. Fire Protection Contractor shall prepare detailed 1/8" scale (minimum) working drawings conforming to NFPA Standard No. 13, showing the exact location of the sprinkler system located inside the building in relation to other piping systems, air distribution duct, lighting fixtures, heaters, or other items of equipment or installation. The system shall be so arranged and installed that no part thereof will interfere with doors, windows, heating, plumbing, or electrical equipment and sprinkler heads not be located closer than one foot from lighting fixtures or other obstructions. Fire Protection Contractor shall maintain coordination among the trades to avoid any interference with potential effectiveness of the automatic sprinkler system.

B. Fire Protection Contractor shall also submit a site plan drawing showing outside sprinkler and fire protection work to be installed by Fire Protection Contractor. The drawing shall show exact locations of underground fire protection piping, and shall show other underground utility lines such as water, gas, sewer, and storm drain lines for coordination purposes.

C. Fire Protection Contractor shall submit 4 (4) sets of sprinkler shop drawings and hydraulic calculations to the Design Professional for approval. The Contractor will submit sprinkler shop drawings and hydraulic calculations to the insuring agency and the State Fire Marshal for approval.

PART 2: PRODUCTS (NOT APPLICABLE)

PART 3: EXECUTION (NOT APPLICABLE)

END OF SECTION

FIRE PROTECTION – RELATED WORK **15302**

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, specifications sections, and general conditions section apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of Fire Protection Work is indicated on the drawings and by requirements of the specifications.

1.03 RELATED WORK

A. Types of mechanical related work specified in this section include the following:

1. Excavation and backfill for sprinkler and fire protection work.
2. Concrete work for sprinkler and fire protection work.
3. Patching concrete or paving which is required to be cut to accommodate sprinkler and fire protection work.

1.04 PROJECT CONDITIONS

A. Existing Utilities: Locate and protect existing utilities and other underground work in a manner which will ensure that no damage or service interruption will result from excavating or backfill.

B. Protect property from damage which might result from excavating and backfilling.

C. Coordinate excavations with weather conditions to minimize possibility of washouts, settlement, or other damages or hazards.

PART 2: PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Basic Materials and Methods per NFPA, and local and state code requirements.

B. The General Contractor will provide formed concrete requirements for sprinkler and fire protection work.

PART 3: EXECUTION

3.01 EXCAVATION FOR SPRINKLER AND FIRE PROTECTION WORK

A. Excavation of trenches for sprinkler and fire protection work shall be performed in accordance with requirements of NFPA Bulletin No. 24.

B. Trenches for underground piping shall be excavated true to line and shall be accurately graded, as indicated on the drawings, to provide uniform bearing and support. Depth of trenches shall be adequate to provide proper depth for piping below driveways, railroads, and roadways, and shall be of proper depth to provide the pipe with protection against freezing and mechanical injury.

C. Trenches cut through rock shall be excavated at least 6" below the pipe depth and tamped backfilled with clean dirt at least 6" below pipe and for at least 2 feet above the pipe.

D. Do not excavate for underground work until the work is ready to proceed without delay so that total time lapse from excavation to completion of backfilling will be minimal.

E. Excavate trenches of sufficient width for proper installation of the work. Shore and brace trenches, as necessary, to protect workers and adjacent structures. Comply with local codes and regulations, OSHA requirements or, in the absence thereof, with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Inc. Do not remove sheeting until trench is backfilled sufficiently to protect pipe and prevent injurious caving.

F. Depth for Unsatisfactory Soil Conditions: Where directed (because of unsatisfactory soil condition at bottom of indicated excavation), excavate additional depth, as directed, for each satisfactory soil bearing condition. Backfill with sub-base material, compacted, as directed, to indicate excavation depth.

G. Store excavated material (temporarily) near excavation, in a manner which will not interfere with or damage excavation or other work. Retain excavated material which complies with requirements for backfill material. Dispose of excavated material which is either in excess of quantity needed for backfill, or does not comply with requirements for backfill material. Remove and dispose of unused material from project site in a lawful manner.

H. Wherever, in the opinion of the Design Professional, the soil at or below the requisite pipe grade is unsuitable for supporting piping and appurtenances, special supports shall be provided.

I. Where concrete thrust blocks are to be used for anchoring underground piping, trenches shall be cut to provide a bearing surface on undisturbed soil.

3.02 DEWATERING

A. Maintain dry excavations for sprinkler and fire protection work by removing water. Protect excavations from inflow of surface water. Pump minor inflow of ground water from excavations, and protect excavations from major inflow of ground water by installing temporary sheeting and waterproofing.

B. Provide adequate barriers which will protect other excavations and below grade property from being damaged by water, sediment, or erosion from or through sprinkler and fire protection work excavations.

3.03 BACKFILLING

A. Backfilling of trenches shall be done in accordance with the requirements of NFPA-24, and shall be done only after pipe lines and appurtenances have been recorded on as-built drawings. Trenches shall be backfilled between joints before testing of piping to prevent movement of pipe. Joints shall not be covered until pipe is hydrostatically tested and joints checked for leaks.

B. Backfill shall be well tamped in layers under and around pipes (and puddled where possible) to prevent settlement or lateral movement, and shall contain no ashes, cinders, refuse, organic materials, or other corrosive materials.

C. Backfilling of trenches or other excavation shall be accomplished in a manner approved by the Design Professional to ensure, in the opinion of the Design Professional, the following compaction:

1. Ninety-Five percent (95%) compaction standard proctor within the building area.
2. Ninety percent (90%) compaction in parking area and grass areas.

D. Trenches for water lines shall be of a depth that will provide adequate cover over the top of the pipe to prevent freezing and physical damage, and to avoid interference of the lines with other utilities.

E. Over depths shall be backfilled with loose, granular, moist earth, thoroughly tamped. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe is encountered in the bottom of the trench, such soil shall be removed to the depth required, and the trench backfilled to the proper grade with suitable materials.

F. In areas where fill is to be placed, no piping shall be installed until after fill is placed. After piping is installed, fill shall be replaced and compacted by Fire Protection Contractor.

G. Condition backfill material either by drying or by adding water uniformly, to whatever extent may be necessary to facilitate compaction to required densities. Do not backfill with frozen soil materials.

H. Backfill simultaneously on opposite sides of sprinkler work and compact simultaneously. Do not dislocate the work from installed positions.

3.04 PATCHING OF CONCRETE OR PAVED AREAS

A. Where placement of underground piping disturbs paved areas, the pavement shall be repaired with material of the same type and strength as that removed. The patching and backfilling preparations shall be performed by workers skilled in the trade.

END OF SECTION

FIRE PROTECTION – OUTSIDE PIPING SYSTEM 15303

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, specifications sections, and general conditions section apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of Fire Protection Work is indicated on the drawings and by requirements of the specifications.

1.03 RELATED WORK

A. Furnish and install new underground fire main around the building as indicated on site plan.

B. Furnish and install a new fire main connection to public water main.

C. Furnish and install section valves with post indicators and tamper switches for underground fire main.

D. Furnish and install fire hydrants.

E. Furnish and install necessary structural supports, tie rods, and anchors for the underground fire main.

F. Everything necessary for a complete and satisfactory underground fire main piping system shall be provided by Fire Protection Contractor.

PART 2: PRODUCTS

2.01 PIPING

A. All ferrous metal pipe shall be lined, and steel pipe shall be coated and wrapped with joints field coated and wrapped after assembly.

B. Joints shall be of an approved type, and fittings shall be of an approved type with joints and pressure class ratings compatible with the pipe used. Steel pipe fittings shall be coated, wrapped, and lined.

C. Underground fire mains shall be ANSI/AWWA C151/A21.51 asphalt coated, cement lined, ductile iron water main, or an approved equal, with slip joints and/or mechanical joints, ANSI/AWWA C111/A21.11. Lug bolts shall be low alloy metal. In lieu of ductile iron pipe, the Contractor may use ANSI/AWWA C900, class 150 PVC pressure pipe with slip joints.

2.02 POST INDICATOR VALVES

A. Post indicator valves shall be Kennedy Fig. 541, or an approved equal, with FM approved non-rising stem gate valve designed for 175 PSI working pressure. Valve shall be designed with flanges for mounting post indicator. Valve shall be iron body, double disc, parallel seats, bronze mounted, non-rising stem type.

B. Post indicator shall be FM approved type designed for vertical mounting outdoors, and shall have indicator window and locking mechanism and operating wrench. Furnish and install on each post indicator a Potter Electric Signal Co. Model PIVSU-A1 tamper switch.

2.03 FIRE HYDRANTS

A. Furnish and install fire hydrants where indicated on the drawings. The fire hydrants shall be compression type, UL and FM listed and approved. Hydrant length shall be selected for proper setting for each trench depth. Hydrant shoe shall be provided with lugs for strapping. Bronze drain opening shall be provided in hydrant shoe for proper drainage of the barrel.

B. Each hydrant shall have one 4 ½" pumper hose connection and two 2½" hose connections with threads conforming to the requirements of the local fire department.

C. Iron parts of the valves shall be made of high strength gray iron conforming to specification A-126, Class B, of the American Society of Testing Materials (ASTM). Non-corrodible metal parts shall be made of composition brass conforming to ASTM Specification B-62. Other materials shall be of best quality obtainable for their respective uses. The hydrants shall be designed for 150 PSI working pressure and tested to 350 PSI hydrostatic pressure. Hydrant main valve opening shall be 5¼" nominal size.

D. Hydrants shall be painted one coat of red lead. Portion of valve buried in the ground shall be given one heavy coat of bituminous pipe enamel. Length of bury depth of hydrant shall be 4'-0".

E. Hydrants shall be provided with spanner wrench, and hydrants shall be open to the left, and operating unit shall conform to the standards of the local fire department.

F. Each fire hydrant shall be installed with an FM approved underground non-rising stem gate valve, Kennedy Fig. 703X, or an approved equal, in the supply line to the hydrant. Each valve on underground piping shall be provided with an adjustable cast iron roadway valve box of a size suitable for the valve on which it is to be used, minimum 5¼" shaft diameter. Valve boxes shall be given a heavy coat of bituminous paint.

2.04 GATE VALVES

A. Valves 2½" and larger shall be iron body OS&Y flanged pattern for 175 lb working pressure, Kennedy Fig. 68, or approved equal. Valves 2" and smaller shall be Kennedy Fig. 66, or an approved equal, bronze OS&Y wedge disc gate valves with threaded ends for 175 lb working pressure. Valves shall close when turned in clockwise direction. Approved butterfly valves may be used in lieu of gate valves where approved by codes.

2.06 CHECK VALVES

A. Check valves shall be straightway type, iron body swing check with bronze rubber faced disc designed for 175 lbs, wwp, UL and FM approved type for sprinkler work. Two and one-half inch (2½") size and larger; flanged ends, 2" size and smaller; threaded ends. Kennedy valve Fig. 126A, or an approved equal.

2.07 BACKFLOW ASSEMBLY

A. Furnish and install where directed by local fire marshal:

1. UL listed and FM approved Watts Model 709 DCDA-OSY-RW, or an approved equal, double check detector assembly meeting AWWA-C510-92 standards. Assembly shall have resilient seated OS&Y gate valves, two (2) internally loaded, independently operating check valves, and four (4) resilient seated test cocks.

B. Assembly shall be suitable for supply pressures up to 175 PSI and 110°F constant water temperatures.

C. The bypass shall consist of an approved double check valve assembly, shut-off valves, test cocks, and a meter with low flow accuracy.

D. Install per manufacturer's installation requirements and as indicated on drawings. Provide a minimum of 12" clearance between device and floor or grade. Provide concrete support blocks below valve flanges for proper support to prevent flange damage.

PART 3: EXECUTION

3.01 PIPING INSTALLATION - GENERAL

A. Installation of automatic sprinkler and fire protection piping system shall conform to requirements of NFPA 13 and 24 and local and state codes. Underground piping shall be installed at proper depth to prevent freezing (Refer to local codes and requirements).

B. Install piping system accurately in accordance with approved drawings and, in the event of conflicts, consult with the Design Professional before proceeding further. Changes in the routing of pipe from the layout shown on the drawings shall be coordinated with the Design Professional and other crafts before proceeding.

C. Pipe supports, sway braces, hangers, clamps, anchors, etc., and other accessories shall be of an approved pattern placed to conform to the requirements of NFPA.

D. Sprinkler piping shall be pitched to provide for proper drainage.

E. Trenching and backfilling shall be executed in accordance with Fire Protection specification section 15302.

3.02 PIPE AT FOOTINGS, BEAMS, FLOORS, AND WALLS

A. Piping shall not be run through footings. They shall cross through sleeves above footings. Pipes running parallel to footings shall have the minimum clearance required by the governing codes.

B. Structural members or reinforcing steel shall not be cut or weakened. Where construction necessitates the routing of piping through structural member, or under footings, written permission to make such installation shall be obtained from the Design Professional. Such permission will not be granted, however, if any other method of installation is possible.

C. Except where special permission is granted by the Design Professional for pipe to be cast-in place, pipes passing through concrete or masonry walls, or beams, shall be provided with steel pipe sleeves.

3.03 LAYING OF PIPE

A. Laying of underground piping shall conform to requirements of NFPA-24. Provide necessary pipe anchors and thrust blocks to properly secure piping. Tees, caps, plugs, bends, elbows, and hydrant branches shall be restrained against movement.

3.04 HYDROSTATIC TESTING

A. Underground yard piping shall be hydrostatically tested at not less than 200 PSI pressure for two hours in the presence of the Design Professional and proper authorities having jurisdiction in accordance with requirements of Chapter 8 of NFPA-24.

B. Each fire hydrant and control valve shall be operated and checked under system water pressure to ensure proper operation.

C. After the piping system has been tested and approved, the installing Contractor shall present to the Owner the proper "Test Certificate", as outlined in NFPA-24.

3.05 FLUSHING OF UNDERGROUND PIPING SYSTEM

A. Flushing of underground mains and lead-ins shall be done in accordance with Chapter 8 of NFPA-24.

B. Flushing of underground mains and lead-ins shall be done before connection is made to sprinkler systems or to other fire protection system piping.

END OF SECTION

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and Division-15 BMR specifications sections apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of Fire Protection Work is indicated on the drawings and by requirements of the specifications.

1.03 RELATED WORK

A. Types of mechanical related work specified in this section include the following:

1. Furnish and install wet pipe hydraulically calculated automatic sprinkler systems for areas of the building as indicated on the drawings.
2. Sprinkler heads and head guards.
3. All structural supports, hangers, stands, tie rods and anchors required for the automatic sprinkler system.
4. Riser alarm check valves, alarm flow switches and accessories.
5. Everything necessary for a complete and satisfactory automatic sprinkler system, as indicated on the drawings, specified herein, or required by codes, shall be provided by Fire Protection Contractor.

PART 2: PRODUCTS

2.01 INTERIOR PIPING AND FITTINGS

A. Interior piping shall be steel pipe meeting requirements of NFPA-13.

B. Overhead and above ground piping shall have threaded, welded, flanged, or mechanical grooved coupling fittings, according to the requirements of NFPA-13.

2.02 HANGERS

A. Sprinkler piping shall be supported from the building structure by means of metal pipe hangers and supports according to requirements of NFPA-13.

2.03 GATE VALVES

A. Valves 2½" and larger shall be iron body OS&Y flanged pattern for 175 lb working pressure, Kennedy Fig. 68, or approved equal. Valves 2" and smaller shall be Kennedy Fig. 66, or an approved equal, bronze OS&Y wedge disc gate valves with threaded ends for 175 lb working pressure. Valves shall close when turned in clockwise direction. Approved butterfly valves may be used in lieu of gate valves where approved by codes.

2.04 CHECK VALVES

A. Check valves shall be straightway type, iron body swing check, bronze rubber faced disc, designed for 175 lbs, wwp, UL and FM approved type for sprinkler work. Valves 2½" size and

larger, flanged ends, and valves 2" size and smaller, threaded ends. Kennedy valve Fig. 126A, or an approved equal.

2.05 GLOBE AND ANGLE VALVES

A. Globe valves shall be Kennedy Fig. 97-SD, or an approved equal, bronze rising stem valve, designed for 200 lb working pressure. Angle valves shall be Kennedy Fig. 98-SD, or an approved equal, designed for 200 PSI working pressure.

2.06 ALARM VALVES

A. Alarm valves shall be FM and UL approved, wet type, as required, flanged and gasket type for vertical riser connections complete with approved auxiliary features, including retard chambers, gauges, drains, water motor alarm gong, flow switch, valved test connections, and necessary fittings and accessories required. Each alarm valve shall be equipped to give local and transmitted alarm signal upon operation.

2.07 FLOW SWITCHES

A. Furnish and install flow switches, as indicated on the drawings. The flow switches shall be UL listed for sprinkler system supervisory service and shall have retards adjustable up to two minutes, and be furnished with one normally open switch that will close upon water flow.

2.08 IDENTIFICATION OF VALVES

A. Control, drain, test and alarm valves shall be provided with metal identification signs of standard design conforming to NFPA Standard No. 13.

2.09 TAMPER SWITCHES

A. Furnish and install a Potter Electric Model OYSU-A2, or equal, tamper switch for supervisory service of OS&Y water supply shut-off valves.

B. Tamper switch shall e designed for 120/1/60 electric service, and shall be UL listed and FM approved.

2.10 SPRINKLER HEADS

A. Rooms on first and second floors with suspended ceilings – recessed chrome plated pendent sprinklers 155° F quick response heads.

B. Above first and second floor ceilings with open wood joist – 200° F quick response brass upright heads.

C. Covered balconies on first and second floors – 155° F quick response dry sidewall heads.

2.11 EXTRA SPRINKLER HEADS

A. Fire Protection Contractor shall furnish a cabinet for extra sprinkler heads and shall furnish 12 extra sprinkler heads of assorted temperature rating and of the type used throughout the installation, also including a special sprinkler head wrench mounted in the cabinet for use in the removal and installation of sprinklers.

PART 3: EXECUTION

3.01 INSTALLATION OF SPRINKLER SYSTEM

A. Installation of automatic sprinkler system shall conform to requirements of NFPA-13 and local and state codes.

B. Install sprinkler system accurately in accordance with approved drawings and, in the event of conflicts, consult with the Design Professional before proceeding further. Changes in the routing of pipe from the layout shown on the drawings shall be coordinated with the Design Professional and other crafts before proceeding.

C. It shall be the responsibility of Fire Protection Contractor to install sprinkler heads, piping and sprinkler equipment per NFPA requirements and to coordinate with other trades and contractors to avoid interference with building structure, lights, HVAC equipment, ductwork, etc. Maintain proper clearances between sprinkler heads and nearby objects which might affect water flow pattern.

3.02 PIPE SUPPORTS

A. Metal pipe supports, sway braces, hangers, clamps, and other accessories shall be of an approved pattern placed to conform to the requirements of NFPA-13.

B. Sprinkler piping shall be pitched to provide for proper drainage.

3.03 SPECIAL SUPPORTS

A. Fire Protection Contractor shall include in the bid the cost of special structural supports necessary to properly support his piping from the building structure. Special structural supports shall meet with the approval of the Design Professional.

3.04 WALL, FLOOR AND CEILING PLATES

A. Piping passing through floors and walls shall be provided with painted cast iron plates.

B. Pendent sprinklers mounted in suspended ceilings shall be installed with chrome plated escutcheons.

C. Full recessed pendent sprinklers mounted in suspended ceilings shall be provided with white cover plates.

3.05 SLEEVES

A. Steel pipe sleeves shall be provided for pipes passing through masonry walls, floors and ceilings. Sleeves shall extend completely through construction and, in the case of floors, extend 4" above the floor, except where the floor is laid on earth. **Pipe penetrations through non-rated walls shall be sealed smoke-tight. Penetrations through rated walls shall be done with UL approved penetrations for that type of rated wall**.

3.06 DRAINS

A. Drains shall be provided from water motors, sprinkler valves, trapped portions of cross mains, and wherever required to properly drain the system.

3.07 CLEANING

A. Fire Protection Contractor shall clean sprinkler system free of scale and other foreign matter before installation.

B. After installation, the entire sprinkler system, including piping and equipment, shall be cleaned of dirt, oil, or other foreign matter, and left in a clean condition suitable for painting.

3.08 HYDROSTATIC TESTING

A. Sprinkler system piping shall be hydrostatically tested at not less than 200 PSI pressure for two hours in the presence of the Design Professional and proper authorities having jurisdiction in compliance with requirements of Chapter 8 of NFPA-24.

B. After the piping system has been tested and approved, the installing Contractor shall present to the Owner the proper "Test Certificate", as outlined in NFPA-24.

END OF SECTION

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and Division-15 BMR specifications sections apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of Fire Protection Work is indicated on the drawings and by requirements of the specifications.

1.03 RELATED WORK

A. Types of mechanical related work specified in this section includes the following:

1. Furnish and install dry pipe hydraulically calculated automatic sprinkler systems for third floor level and attic areas of the building, as indicated on the drawings.
2. Sprinkler heads and head guards.
3. Structural supports, hangers, stands, tie rods and anchors required for the automatic sprinkler system.
4. Riser dry pipe valves, alarm flow switches, air pressure alarm switches, and accessories.
5. Air compressor equipment, piping, and accessories.
6. Everything necessary for a complete and satisfactory automatic dry sprinkler system, as indicated on the drawings, specified herein, or required by codes, shall be provided by Fire Protection Contractor.

PART 2: PRODUCTS

2.01 INTERIOR PIPING AND FITTINGS

A. Interior piping shall be galvanized welded and seamless steel pipe ANSI/ASTM-A795, meeting requirements of NFPA-13, Chapter 3.

B. Overhead and above ground piping shall have threaded, welded, flanged, or mechanical grooved coupling fittings in accordance with requirements of NFPA-13, Chapter 3.

2.02 HANGERS

A. Sprinkler piping shall be supported from the building structure by means of metal pipe hangers and supports, according to requirements of NFPA-13, Chapter 3.

2.03 GATE VALVES

A. Valves 2½" and larger shall be iron body OS&Y flanged pattern for 175 lb working pressure, Kennedy Fig. 68, or approved equal. Valves 2" and smaller shall be Kennedy Fig. 66, or approved equal, bronze OS & Y wedge disc gate valves with threaded ends for 175 lb working pressure. Valves shall close when turned in clockwise direction.

2.04 CHECK VALVES

A. Check valves shall be straightway type, iron body swing check, bronze rubber faced disc, designed for 175 lbs. wwp, UL and FM approved type for sprinkler work. Valves 2½" and larger, flanged ends. Valves 2" size and smaller, threaded ends. Kennedy valve Fig. 126A, or an approved equal.

2.05 GLOBE AND ANGLE VALVES

A. Globe valves shall be Kennedy Fig. 97-SD, or an approved equal, bronze rising stem valve, designed for 200 lb working pressure. Angle valves shall be Kennedy Fig. 98-SD, or an approved equal, designed for 200 PSI working pressure.

2.06 DRY VALVES

A. Dry pipe valves shall be FM and UL approved dry type Reliable model "D", or an approved equal, flanged and gasket type for vertical riser connections, complete with approved auxiliary features, including accelerator, gauges, drains, water motor alarm gong, pressure type flow switch, valved test connections, air pressure alarm switch, and necessary fittings and accessories required. Each alarm valve shall be equipped to give local and transmitted alarm signal upon operation.

2.07 PRESSURE FLOW SWITCHES

A. Furnish and install pressure flow switches, Potter Electric Model PS10-2, as indicated on the drawings. The flow switches shall be UL listed and FM approved for sprinkler system supervisory service, wired for 120/1/60 electric service and shall be DPDT type.

2.08 LOW AIR PRESSURE ALARM SWITCHES

A. Furnish and install low air pressure alarm switches where indicated on the drawings. Switches shall be United Electric Model J33AX-5835 designed for 120/1/60 electrical service. Switches shall be UL listed and FM approved for sprinkler system supervisory service.

2.09 TAMPER SWITCHES

A. Furnish and install a Potter Electric Model OSYSU-A2, or equal, tamper switch for supervisory service of the OS&Y water supply shut-off valve at the base of the dry pipe system sprinkler riser. Use Potter Electric Model PIVSU-A2 for valves with post indicators.

B. Tamper switch shall be designed for 120/1/60 electric service, and shall be UL listed and FM approved.

2.10 AIR COMPRESSOR

A. Furnish and install air compressor system for dry pipe system complete with air compressor, air pressure controls, shut-off valves, relief valve, check valve, piping, and fittings. Furnish and install everything necessary for an approved system. Air compressor shall be sized in compliance with NFPA requirements and shall have ASME constructed tank.

B. Compressed air piping shall be Schedule 40 black steel pipe with screwed fittings, or Type "L" hard drawn copper tubing with wrought copper solder fittings.

2.11 IDENTIFICATION OF VALVES

A. Control, drain, test, and alarm valves shall be provided with metal identification signs of standard design conforming to NFPA Standard No. 13.

2.12 SPRINKLER HEADS

A. Rooms on third floor with suspended ceilings – recessed chrome plated quick response dry pendent drops.

B. Above third floor ceilings with open wood joist – 200° F quick response brass upright heads.

C. Attic space – 200° F quick response brass upright heads.

2.13 EXTRA SPRINKLER HEADS

A. Fire Protection Contractor shall furnish a cabinet for extra sprinkler heads and shall furnish 12 extra sprinkler heads of assorted temperature ratings and of the type used throughout the installation, including, also, a special sprinkler head wrench mounted in the cabinet for use in the removal and installation of sprinklers.

PART 3: EXECUTION

3.01 INSTALLATION OF SPRINKLER SYSTEM

A. Installation of automatic dry sprinkler system shall conform to requirements of NFPA-13 and local and state codes.

B. Install sprinkler system accurately in accordance with approved drawings and, in the event of conflicts, consult with the Design Professional before proceeding further. Changes in the routing of pipe from the layout shown on the drawings shall be coordinated with the Design Professional and other crafts before proceeding.

3.02 PIPE SUPPORTS

A. Metal pipe supports, sway braces, hangers, clamps, etc., and other accessories shall be of an approved pattern, placed to conform to the requirements of NFPA-13.

B. Sprinkler piping shall be pitched to provide for proper drainage.

3.03 SPECIAL SUPPORTS

A. Fire Protection Contractor shall include in his bid the cost of special structural supports necessary to properly support his piping from the building structure. Special structural supports shall meet with the approval of the Design Professional.

3.04 WALL, FLOOR, AND CEILING PLATES

A. Piping passing through floors and walls shall be provided with painted cast iron plates.

B. Sprinklers mounted in suspended ceilings shall be installed with chrome plated escutcheons.

3.05 SLEEVES

A. Steel pipe sleeves shall be provided for pipes passing through masonry walls, floors, and ceilings. Sleeves shall extend completely through construction and, in the case of floors, extend 4" above the floor, except where the floor is laid on earth.

3.06 DRAINS

A. Drains shall be provided from water motors, sprinkler valves, trapped portions of cross mains, and wherever required to properly drain the system.

3.07 CLEANING

A. Fire Protection Contractor shall clean sprinkler system free of scale and other foreign matter before installation.

B. After installation, the entire sprinkler system, including piping and equipment, shall be cleaned of dirt, oil, or other foreign matter, and left in a clean condition suitable for painting.

3.08 TESTING

A. After flushing system, test sprinkler system piping hydrostatically for a period of two hours at not less than 200 PSI. Check system for leakage of joints. Repair leaking joints.

B. Test system for proper operation of compressed air equipment, alarm, flow switches, and pressure switches.

C. Testing shall be done in the presence of the Design Professional. Testing shall be done to comply with requirements of NFPA-13. Provide Owner with Test Certificate.

END OF SECTION

FIRE PROTECTION – PROTECTION OF PIPING SUBJECT TO EARTHQUAKE 15306

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and Division-15 BMR specifications sections apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of Fire Protection Work is indicated on the drawings and by requirements of the specifications.

1.03 RELATED WORK

A. Types of mechanical related work specified in this section include the following:

1. Sprinkler systems shall be protected to minimize or prevent pipe breakage due to earthquakes in accordance with the requirements of NFPA-13 and local and state codes, ordinances, and requirements.
2. Furnish and install necessary flexible couplings, swing joints, and sway bracing for sprinkler piping.
3. Hangers and supports, as required, for piping in accordance with NFPA-13.
4. Provide clearances between piping, walls, and floors, as outlined in NFPA-13.

PART 2: PRODUCTS

2.01 INTERIOR PIPING AND FITTINGS

A. Interior piping shall be ANSI/ASTM steel pipe, meeting requirements of NFPA-13.

B. Overhead and above ground piping shall have threaded, welded, flanged mechanical grooved coupling and flexible couplings according to NFPA-13.

2.02 HANGERS

A. Sprinkler piping shall be supported from the building structure by means of approved pipe hangers and supports according to requirements of NFPA-13.

2.03 HANGER CLAMPS

A. Hanger clamps used to attach hangers to building structure shall be of the approved type to prevent movement of the clamp. “C” type clamps shall be provided with retainer clips.

2.04 FLEXIBLE COUPLINGS

A. Furnish and install flexible pipe couplings in sprinkler piping 3½ inches and larger in accordance with section 4-5.4.3.2 of NFPA-13. Generally, flexible pipe couplings shall be provided as follows:

1. Within 24 inches of top and bottom of risers.
2. Within 12 inches above or below floor in multi-story buildings.
3. On one side of concrete or masonry walls within 3 feet of the wall.
4. At building expansion joints.

2.05 SWAY BRACING

A. Furnish and install lateral and longitudinal sway braces as required in NFPA-13. Size and location of sway braces shall be as outlined in NFPA-13. The maximum allowable spacing between longitudinal sway braces shall not exceed 80 feet on centers, and the maximum spacing between lateral sway braces shall not exceed 40 feet on centers.

PART 3: EXECUTION

3.01 INSTALLATION

A. Installation of flexible couplings, swing joints, sway bracing, hangers, clamps, and pipe sleeves shall be in accordance with NFPA-13 and/or local codes for piping subject to earthquakes.

END OF SECTION

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings specifications sections and general conditions section apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of Fire Protection Work is indicated on the drawings and by requirements of the specifications.

1.03 RELATED WORK

A. Furnish and install a diesel engine driven fire pump, as indicated on drawings and specified herein, including necessary items for a NFPA approved installation, including piping, valves, jockey pump, controls, fuel oil tank, fuel oil piping, and battery starting unit.

1.04 QUALITY ASSURANCE

A. Equipment and complete installation shall conform to the requirements of NFPA-20.

1.05 WORK BY OTHERS

A. Building Trades Contractor will furnish and install pump house, including concrete foundations and pads for pumps and equipment.

B. Electrical wiring for fire pump equipment installation will be furnished and installed by the Electrical Contractor. Fire Protection Contractor shall furnish complete wiring diagrams for the fire pump and associated equipment, and shall give the diagrams to the Electrical Contractor for wiring of the equipment.

PART 2: PRODUCTS

2.01 DIESEL ENGINE DRIVEN FIRE PUMP

A. Diesel Driven Fire Pump: Fire pump shall be horizontal split case type, UL and FM approved, rated to deliver 1000 GPM at 140 PSI when supplied with a suction at 55 PSI. Pump shall be Aurora #5-481-15 driven by a UL and FM approved diesel engine Clarke #JU4H-UF-58, having sufficient HP, as outlined in NFPA-20, current edition. Pump and engine shall operate at 1800 RPM maximum.

B. Pump shall be mounted on a fabricated steel base and connected to the engine by a flexible coupling. Coupling shall be totally enclosed in a coupling guard.

C. Fire Pump, related equipment and piping shall conform to the standard conditions of the latest edition of NFPA-20, UL, and FM.

D. Diesel Fire Pump Controller: Controller shall be combined manual and automatic type Metron Model FD4, UL and FM approved for operation with diesel engines. Controller shall be free standing type, including, but not limited to, the following: Weekly test start, built-in battery

charger and pressure recorder. Controller shall be manufactured in accordance with NFPA-20 and include necessary alarm relays.

E. Jockey Pump: Jockey pump shall be centrifugal, close coupled type, rated to deliver 25 GPM at 120 PSI with 0 PSI suction pressure. Pump shall be driven by a 3 HP, 208/3/60, ODP motor at 3600 RPM. Pump shall be cast iron, bronze fitted design with a mechanical seal.

F. Jockey Pump Controller: Jockey pump controller shall be Metron Model M15A combined manual/automatic type for operation of 208/3/60. Controller to include mercoid pressure switch, magnetic starter, fusible disconnect and H.O.A. switch.

G. Fire Pump Accessories: The following accessories shall be provided by the pump manufacturer: Suction and discharge gauges with 1/4" shut-off cocks, capacity plate; securely attached to pump, automatic air release valve, main relief valve, enclosed waste cone, test header, and hose valves with caps and chains, fuel tank of sufficient size to operate engine for 10 hours, but no less than 300 gallons, fuel tank saddles, fuel accessories, batteries with rack and cables, and muffler with flexible exhaust connector.

H. Sensing lines to fire pump controller and jockey pump controller shall be installed according to NFPA-20. Engine cooling water discharge line and pump packing wells shall be piped to drain. Fuel piping between fuel tank and engine shall be in accordance with NFPA-20.

I. Fire Protection Contractor shall be responsible for providing a complete approved unit. Any items not mentioned in above specifications, but required by NFPA-20, UL, FM, or Local Fire Marshal, shall be provided.

J. Contractor shall be responsible for acceptance test and training plant personnel in operation and maintenance of equipment.

2.02 REMOTE ALARM PANEL FOR DIESEL FIRE PUMP

A. Fire Protection Contractor shall furnish and install a remote alarm and signal device for the diesel fire pump controller in conformity with NFPA-20.

B. The remote alarm panel shall be installed in the main building, as indicated on the drawings, and shall be Metron Model 1802-B, or approved equal, remote alarm panel in flush mounting enclosures.

C. The alarm panel shall contain solid state circuitry having visual and audible alarms for engine malfunctions, loss of AC power, controller control switch set for proper operation, engine running and battery malfunctions, press to test switches for lights and alarm silencing pushbuttons.

D. Wiring for the remote alarm panel will be by the Electrical Contractor under Division 16 of these specifications.

PART 3: EXECUTION

3.01 INSTALLATION

A. Fire pump installation shall conform to the requirements of NFPA-20. Accessories and equipment shall be furnished and installed by the Fire Protection Contractor, as required by NFPA-20, UL, FM, or Local Fire Marshal, for an approved installation.

B. The Fire Protection Contractor shall provide acceptance test of the installation, as outlined in NFPA-20, and shall make necessary corrections or adjustments, as required, to put the system in proper operating conditions. Fire Protection Contractor shall provide necessary equipment to perform the hydrostatic acceptance test.

C. The Fire Protection Contractor shall provide the services of a factory trained service representative to train the plant personnel in the proper operation and maintenance of the equipment.

END OF SECTION