SECTION 21000 - FIRE SUPPRESSION GENERAL CONDITIONS

PART 1 GENERAL

1.01 APPLICABILITY
- A. This section supplements all sections of the Specifications for Division 21 and shall apply to all phases of work hereinafter specified, shown on the Drawings, or required to provide a complete installation of approved fire suppression systems.
- B. The Drawings, General Conditions and General Provisions of the Contract apply to this Section and the other Sections of Division 21 of the specifications. Where conflicts arise between these documents, the more stringent provision will be applicable, subject to the interpretation of the Engineer.
- C. Furnish all labor, material, services, and skilled supervision necessary for the construction, erection, installation, connections, testing, and adjustment of all materials and electrical equipment specified herein, or shown or noted on the Drawings, and its delivery to the Owner, complete in all respects and ready for use.
- D. Products furnished but not installed under this section:
  1. Where plans indicate fixtures or equipment will be furnished by this Contractor for installation by other Contractors, this Contractor shall furnish all such equipment, complete in all respects and ready for installation.
  2. Drawings, instructions, and manuals supplied with equipment furnished under Division 21, but installed under other Divisions shall be carefully preserved and turned over to the installing Contractor.
- E. Products installed but not furnished under this section:
  1. Where plans indicate fixtures or equipment will be furnished by others, this Contractor shall provide all rough-in and supplies and shall connect such equipment to the fire suppression systems.
  2. Drawings, instructions, and manuals supplied with equipment furnished under separate Divisions but installed under Division 22 shall be carefully preserved and turned over to the Architect.

1.02 DEFINITIONS
- A. "Work" is hereby defined as, "The construction and services required by the Contract Documents whether completed or partially completed and includes all labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The work may constitute the whole or a part of the project."
- B. "Furnish" is hereby defined as, "To supply and deliver, unload, and inspect for damage."
- C. "Install" is hereby defined as, "To unpack, assemble, erect, apply, place, finish, cure, protect, clean, connect, and place into operation into the work."
- D. "Provide" is hereby defined as, "To furnish and install."
- E. "Connect" is hereby defined as, "To bring service to the equipment and make final attachment including necessary switches, outlets, boxes, terminations, etc."
- F. "Concealed" is hereby defined as, "Hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction, in crawl spaces, or buried."
- G. "Exposed" is hereby defined as, "Not installed underground nor concealed as defined by the Specifications."
- H. "Drawings" is hereby defined as, "All plans, details, equipment schedules, diagrams, sketches, etc. issued for the construction of the work."
- I. Subgrade Elevations: 4 inches below finish grade elevations indicated on drawings, unless otherwise indicated.
- J. Finish Grade Elevations: 4 inches above subgrade elevations indicated on drawings, unless otherwise indicated.

1.03 CODES AND STANDARDS
- A. Perform work in accordance with the applicable Building Code, Electrical Code, Fire Code, Mechanical Code, Plumbing Code, Energy Code, and all other applicable codes, amendments, and ordinances. Also perform all work in accordance with the Americans with Disabilities Act (ADA) and the Authority Having Jurisdiction (AHJ) including Fire Marshal(s).
- B. Perform work in accordance with Landlord requirements, including any Tenant Criteria Manuals and Lease Exhibits, where applicable.
- C. Perform work in accordance with the applicable utility companies serving the project. Make all arrangements with the utility companies for proper coordination of the work.
- D. Recognized Standards: Design, manufacture, testing and method of installation of all apparatus and materials furnished under the requirements of these Specifications shall conform to the latest publications or standard rules of National Fire Protection Association (NFPA), Factory Mutual Global, where applicable (FMG), Underwriters Laboratories, Inc. (U.L.), American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), National Electrical Code (NEC), and National Electrical Safety Code (NESC).
- E. The Contract Documents shall take precedence where the Contract Documents exceed code, Landlord, utility, or recognized standards requirements.

1.04 PERMITS AND FEES
- A. Permits, licenses, fees, inspections and arrangements required for the work under this Contract shall be obtained by the Contractor at his expense, unless otherwise indicated.
- B. All fees and scheduling associated with obtaining an accurate water flow test shall be at the Contractor's expense.

1.05 CONTRACT DRAWINGS
- A. The Contractor is responsible to obtain, fully understand, and coordinate the work with the complete set of Contract Documents. Any required corrections, including all associated costs, arising from issues caused by the Contractor's failure to understand and/or coordinate the work with the complete set of Contract Documents are the Contractor's sole responsibility.
- B. Work under these sections is diagrammatic unless indicated otherwise and is intended to convey the scope of work and indicate the general arrangement of piping, equipment, and accessories. Follow these drawings in laying out the work and verify spaces for the installation of these materials and equipment. Wherever a question exists as to the exact intended location of pipe, sprinklers, or equipment, obtain instructions from the Architect before proceeding with the work.
- C. Notify the Architect/Engineer for resolution if a discrepancy is discovered within the Contract Documents. Failure of the Contractor to notify the Architect/Engineer of discrepancies shall result in the resolution becoming the Contractor's responsibility and subject to the Architect/Engineer's review and possible rejection. Should the Architect/Engineer reject a discrepancy resolution of which they were not notified, the Contractor is fully responsible to correct the installation, including all associated costs, until approval of the installation is given by the Architect/Engineer.

1.06 EXISTING CONDITIONS
- A. Verify all existing conditions prior to beginning work.
- B. Any existing conditions indicated in the Contract Documents are based on information drawings provided by others and possibly limited field verification. The Contractor shall adjust for actual field conditions at no additional expense to the Owner.
- C. The Contractor shall visit the project site, review existing conditions against the Contract Documents, and familiarize himself with the work prior to bidding and start of the work. By signing the Contract, the Contractor acknowledges the site visit has been completed and the existing conditions are accepted.
- D. The Contractor shall notify the Architect of major discrepancies in writing so the appropriate modifications to the design can be made without delay to the project. The Contractor assumes full responsibility of adjusting for discrepancies of which the Architect is not informed.
- F. The Owner shall have first salvage right on all demolished equipment and materials. The Contractor shall dispose of all demolished equipment and materials the Owner rejects.
- G. The Contractor shall notify the Architect/Engineer of field discrepancies in writing so the appropriate modifications to the design can be made without delay to the project. The Contractor assumes full responsibility of adjusting for discrepancies of which the Architect/Engineer is not informed.
- H. Where connections are made between new work and existing work, the connections shall be made by using materials and methods to suit the actual conditions.
- I. Where existing conditions are shown to be removed, by means of a hatched pattern, on the Drawings, this Contractor shall perform all work required for removal. Existing pipe run-outs shall be removed all the way back to mains and capped using appropriate methods.
- J. Where existing work is to be modified, it shall be done in conformance with these specifications. Materials used shall be same as existing except where specified otherwise.

1.07 SUBMITTALS
- A. Shop Drawings:
  1. Furnish the Architect/Engineer shop drawing portfolios containing names of manufacturer and cut sheets of equipment to be used on the project. Use manufacturer's specification sheets identified by number indicated on drawings or schedules. Indicate catalog number on the cut sheets. As applicable, provide construction data, weight and dimensional data, performance data and listing data as part of the shop drawing submittal. Provide shop drawings for:
     - a. Fire Protection fixtures and equipment.
     - b. Fire Protection materials and accessories.
     - c. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
  2. Submittals are reviewed only for general compliance with the Contract Documents. Dimensions, quantities and details are not checked during submittal review. Review of the submittals does not relieve the Contractor of the responsibility for providing all materials, equipment and accessories necessary for a complete and operational system meeting the requirements of the project and the intent of the Contract Documents. The responsibility for coordination of substituted materials and equipment lies solely with the substituting Contractor.
  3. Approval shall not relieve the Contractor from responsibility for errors on the shop drawings.
  4. If the shop drawings deviate from the contract documents, the Contractor shall advise the Engineer of the deviations in writing accompanying the shop drawings, including the reasons for the deviations.
- B. Project Record Documents: Record actual locations of components and tag numbering.
- C. Operation and Maintenance Data: Include installation instructions and spare parts lists.
- D. Maintenance Data: Include assembly drawings, bearing data including replacement sizes, and lubrication instructions.

1.08 QUALITY ASSURANCE
- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience, approved by manufacturer.
- C. Products:
  1. Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
  2. Listed and classified by the local Department of Buildings and furnished with an acceptance number, where applicable.
  3. Listed and classified by the Landlord's and/or Owner's insurance carrier, where applicable.
- D. All equipment and components shall be free of all rust/corrosion or any visible damage. All items not complying with this requirement shall be replaced without any change in the Contract amount.
- E. Equipment performance and accessories shall be as scheduled on the Drawings and specified herein. Inclusion in both locations is not a prerequisite to inclusion in the Contract. Equipment and accessories specified in either location shall be included in the Contract. Provide all necessary accessories and connections as required for a complete, functional system, including all required components reasonably inferred to as necessary although such components may or may not be specifically indicated in the Contract Documents.
- F. Code or utility company requirements shall supersede any conflicting requirements of this section.
- G. Fill Composition Test Reports: Results of laboratory tests on actual materials used; Compaction Density Test Reports.

1.09 DELIVERY, STORAGE, AND HANDLING
- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.
- E. Equipment: Protect equipment from physical damage by storing off site until the project is ready for immediate installation. Provide temporary caps on all pipes to prevent debris from entering the pipe.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS
- A. The manufacturers listed are listed to set minimum standards for quality, design, and functionality. The products of other manufacturers may be submitted, at the Contractor's option, during shop drawing review unless indicated otherwise. The products of other manufacturers shall meet or exceed all requirements of the Contract Documents. The Contractor accepts all responsibility for costs and coordination issues arising out of the substitution of materials or equipment, and the coordination of such substitutions with all other contractors and subcontractors.
- B. Sprinkler Systems: Conform work to NFPA 13 and all local requirements.
- C. Standpipe and Hose Systems: Conform to NFPA 14 and all local requirements.
- D. Welding Materials and Procedures: Conform to ASME Code.

PART 3 EXECUTION

3.01 COORDINATION OF WORK
- A. Examine the Contract Documents as a whole for the work of other trades. Coordinate all work accordingly.
- B. Work lines and established heights shall be in strict accordance with architectural drawings and specifications insofar as these drawings and specifications extend. Verify all dimensions shown and establish all elevations and detailed dimensions not shown.
- C. Promptly report to the Architect any delay or difficulties encountered in the installation of the work, which might prevent prompt and proper installation, or make it unsuitable to connect with or receive the work of others. Failure to so report shall constitute an acceptance of the work of other trades as being fit and proper for the execution of this work.
- D. Plan, lay out, and coordinate the work with all trades well enough in advance so that it proceeds with a minimum of interference to work that has not been completed and work that is in progress. Inform all trades of openings required for the work and provide all special frames, sleeves, and anchor bolts required. The fire suppression system layout may be altered to suit the conditions, prior to the installation of any work and without additional cost to the Owner. Conflicts arising from lack of coordination shall be this Contractor's responsibility.
- E. Wherever pipe runs in or above ceilings or walls, the Contractor shall arrange the run of pipe in such a manner that it does not interfere with grilles, diffusers, outlet boxes, luminaires, or other ceiling mounted items.
- F. Install systems, materials and equipment to provide for maximum headroom, where no ceiling height is established or indicated on the Drawings. Maintain access to equipment requiring service when selecting mounting elevations.
- G. Install systems, materials and equipment level and plumb, parallel and perpendicular to building lines where exposed to view, unless otherwise indicated.
- H. Conflicts arising from lack of coordination shall be this Contractor's responsibility. The Fire Suppression Contractor shall pay for all extra cutting and patching made necessary by his failure to properly direct such work at the correct time.
- I. Perform all work in conformity with the Contract Documents and afford other trades reasonable opportunity for the execution of their work. Properly connect and coordinate this work with the work of other trades at such time and in such a manner as not to delay or interfere with their work.
- J. Manufacturer's instruction sheets shall be followed explicitly in the installation of all equipment. Where manufacturer's instruction sheets conflict with requirements of these specifications or the Drawings, such conflicts shall be brought to the attention of the Architect/Engineer for clarification.
- K. All roofing penetrations shall be flashed and weather sealed by the roofing manufacturer's authorized roofing contractor at this Contractor's expense. This Contractor shall contract with the factory authorized roofing contractor for the specific roofing system applicable to this Project. The use of an unauthorized roofing contractor may result in removal and replacement of the penetration systems at this Contractor's expense.
- L. Although all such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
- M. Verify and coordinate all requirements and installation details of all materials and equipment that are to be furnished under other Divisions and installed or connected under Division 22 prior to rough-in. Conflicts arising from lack of coordination shall be this Contractor's responsibility. As such, the Contractor is responsible to:
  1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
  2. Determine connection locations and requirements.
  3. Sequence rough-in of fire suppression connections to coordinate with installation of equipment.

3.02 COORDINATION DRAWINGS
- A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of fire suppression equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the work, including (but not necessarily limited to) the following:
  1. Indicate the proposed locations of conduits, equipment, and materials. Include the following:
     - a. Clearances required for maintaining Code required working space.
     - b. Equipment connections and support details.
     - c. Exterior wall and foundation penetrations.
     - d. Fire-rated wall and floor penetrations.
     - e. Sizes and location of required concrete pads and bases.
     - f. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
     - g. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

3.03 EXAMINATION
- A. Verify field measurements are as indicated on the Drawings.
- B. Verify all pipe locations and sizes in field prior to fabrication or installation.
- C. Verify all equipment locations in field prior to installation. Coordinate final locations with all trades.

3.04 INTERFACE WITH OTHER PRODUCTS
- A. Install all pipe, equipment, and accessories to preserve fire resistance rating of partitions and other elements, using materials and methods specified.

3.05 FIELD QUALITY CONTROL
- A. Provide tests as necessary to establish the adequacy, quality, safety, completed status, and suitable operation of each system. Tests shall be conducted under the supervision of the Architect.
- B. Install all equipment, devices, pipe, and materials securely and in a neat and workmanlike manner in accordance with all applicable standards and codes.
- C. Install all equipment, pipe, and materials plumb and level and align and adjust for satisfactory operation.
- D. Install all equipment, pipe, and materials in accordance with the manufacturer's instructions and recommendations.
- E. Inspect all equipment, pipe, and materials for defects.

3.06 ERECTION
- A. Rigging:
  1. The Fire Suppression Contractor shall arrange for all labor and equipment required for the proper installation of the fire Suppression equipment in the locations indicated on the Drawings. Where crane rental or other erection is required, such costs shall be included in the Fire Suppression Contract, unless specific arrangements are made with the General Contractor to cover these costs.
- B. Supplemental Framing:
  1. Provide the design, fabrication, and erection of supplementary structural framing required for attachment of hangers for the devices supporting fire Suppression equipment. Provide framing members of standard rolled steel shapes, A-36 steel. Provide members welded to structural members equal to the specification for the main structural member. Provide "simple beam" type framing with end connections welded or bolted for shear loads. Use cantilevers when detailed or specifically approved by the Architect/Engineer. The Architect/Engineer's approval is required for location of supplementary framing. Use only certified welders. Design framing members for their actual loads, with allowable stresses specified by AISC, without excessive deflection and with consideration for rigidity under vibration, in accordance with standard structural practices. Show on shop drawing supplementary framing, including design loads, member size and location.

3.07 CUTTING, PATCHING, AND PIERCING
- A. Cutting of openings and installation of sleeves or frames through walls and surfaces shall be done in a neat workmanlike manner. Openings shall be cut only as large as required for the installation; sleeves and/or frames installed flush with finished surfaces and grouted in place. Surfaces around openings shall be left smooth and finished to match surrounding surface.
- B. Obtain written permission of the Architect/Engineer before cutting or piercing structural members. Use craftsmen skilled in their respective trades for cutting, fitting, repairing, patching of plaster, and finishing of materials including carpentry work, metal work or concrete work required for this work.
- C. Do not weaken walls, partitions, or floors with cutting. Holes required to be cut in floors must be drilled without breaking out around the holes. The Architect/Engineer will determine suitability of patching and/or refinishing requirements.
- D. The Fire Suppression Contractor is responsible for patching of all openings resulting from the installation or removal of fire Suppression equipment or materials.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
- F. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Subcontractors.
- G. Fire and Smoke Partition Penetrations: The Contractor shall familiarize himself with all fire rated construction and install his work so as to maintain the integrity of the fire code rating. Maintain rating of fire rated and smoke rated construction. Seal annular space around conduits. For fire and smoke rated floors, walls and partitions, use UL listed material that maintains fire rated wall and floor integrity.

3.08 CLEANING AND REPAIR
- A. Clean fire suppression parts to remove harmful materials.
- B. Clean exposed surfaces of all pipe, equipment, and accessories of all dirt, debris, splatter, and other deleterious materials. Follow the manufacturer's recommendations for cleaning as applicable.
- C. Repair or replace damaged pipe, equipment, and accessories, as directed by and to the satisfaction of the Architect, where marring or disfigurement has occurred. All pipe, equipment, and accessories shall be new.

3.09 TESTING AND INSPECTION
- A. Upon completion, the entire system shall be tested under operating conditions.
  1. All equipment shall be tested under service conditions and proven to operate properly and noiselessly.
  2. All additional tests as required throughout this Specification shall be completed with results reported back to the Architect/Engineer for review.
- B. Operate all equipment, after installation and connection. Inspect for improper connections and operation and correct deficiencies as required.
- C. Inspection:
  1. Upon completion of the work, the Contractor shall obtain certificates of inspection and approval from all City and State Authorities Having Jurisdiction.

3.10 PROJECT CLOSEOUT
- A. Project Record Documents: At project closeout, provide one printed copy and one electronic copy of project record drawings to the Owner. Information contained on project record drawings shall include, as a minimum,:
  1. Actual locations of all pipe, equipment, accessories, etc.
  2. Actual pipe sizes and elevations.
  3. Actual routing of all underfloor or below grade piping.
  4. Hydraulic calculation remote area data and associated flow test information.
- B. Operation and Maintenance Data: At project closeout, submit to the Architect two copies of descriptive literature, maintenance and operation data for all piping, equipment, accessories, and materials used. Include maintenance procedures, intervals, and parts list of each item installed under this contract. Include all manufacturer's guarantees and warranties. Also include:

END OF SECTION

SECTION 210500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Pipe, fittings, valves, and connections for systems as applicable to this project. Sprinkler systems: New systems; Dry pipe systems; Wet pipe systems; Standpipe/hose systems; Below ground piping; Above ground piping.

PART 2 PRODUCTS

2.01 FIRE PROTECTION SYSTEMS
- A. Water Supply Testing for All Systems: Perform tests of all supply water sources to determine the potential for corrosion in the fire protection system including tests for microbes most commonly associated with Microbiologically Influenced Corrosion (MIC). Water samples shall be collected as directed by the product literature of the testing organization. Samples shall be delivered to the approved testing laboratory within 72 hours of the time the water sample is obtained. Test results shall be forwarded to the Owner and Engineer along with a report summarizing the recommended corrective action to mitigate the potential for MIC or other types of corrosion.
- B. The Contractor may use any of the following piping materials, at his option, provided the selected material meets with the approval of all State, local authorities and any utility company requirements. Verification of compliance of the selected piping material is the sole responsibility of the installing Contractor.

2.02 ABOVE GROUND PIPING
- A. Steel Pipe: ASTM A 795 Schedule 10, ASTM A 53 Schedule 40, ASTM A 135 Schedule 10, ASTM A 135 UL listed light wall type, or ASTM A 795 Schedule 40, black: Steel Fittings: ASME B16.9, wrought steel, buttwelded, ASME B16.5, buttweld ends, ASTM A 234/A 234M, wrought carbon steel or alloy steel, ASME B16.5, steel flanges and fittings, or ASME B16.11, forged steel socket welded and threaded; Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe; Mechanical Formed Fittings: Carbon steel housing with integral pipe stop and O-ring pocked and O-ring, uniformly compressed into permanent mechanical engagement onto pipe; Schedule 10 steel pipe will not be allowed on any dry pipe sprinkler systems, no exceptions; Threaded or cut groove fittings will not be allowed on any Schedule 10 system, no exceptions.
- B. Copper Tube: ASTM B 75 (ASTM B 75M) or ASTM B 88 (ASTM B 88M), H58 drawn temper: Type: Type M (C); Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze solder joint, pressure type; Joints: AWS A5.8 Classification BCuP-3 or BCuP-4 copper/silver braze or ASTM B 32, alloy Sn95 solder.
- C. CPVC Pipe: ASTM F 442/F 442M, SDR 13.5. (Not permitted in plenum return air ceiling spaces.): Fittings: ASTM F 438 Schedule 40, or ASTM F 439 schedule 80, CPVC; Joints: Solvent welded, using ASTM F 493 cement.

2.03 PIPE HANGERS AND SUPPORTS
- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- D. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
- E. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
- F. Vertical Support: Steel riser clamp.
- G. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- H. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.04 GATE VALVES
- A. Up to and including 2 inches: Bronze body, bronze trim, rising stem, handwheel, solid wedge or disc, threaded ends.
- B. Over 2 inches: Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, handwheel, OS&Y, solid bronze or cast iron wedge, flanged or grooved ends.
- C. Over 4 inches: Iron body, bronze trim, non-rising stem with bolted bonnet, solid bronze wedge, flanged ends, iron body indicator post assembly.

2.05 BUTTERFLY VALVES
- A. Bronze Body: Stainless steel disc, resilient replaceable seat, threaded or grooved ends, extended neck, handwheel and gear drive and integral indicating device, and built-in tamper proof switch rated 10 amp at 115 volt AC.
- B. Cast or Ductile Iron Body: Cast or ductile iron, chrome or nickel plated ductile iron or aluminum bronze disc, resilient replaceable EPDM seat, wafer, lug, or grooved ends, extended neck, handwheel and gear drive and integral indicating device, and internal tamper switch rated 10 amp at 115 volt AC.

2.06 CHECK VALVES
- A. Up to and including 2 inches: Bronze body and swing disc, rubber seat, threaded ends.
- B. Over 2 inches: Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends.
- C. 4 inches and Over: Iron body, bronze disc, stainless steel spring, resilient seal, threaded, wafer, or flanged ends.

2.07 DRAIN VALVES
- A. Compression Stop: Bronze with hose thread nipple and cap.
- B. Ball Valve: Brass with cap and chain, 3/4 inch hose thread.

PART 3 EXECUTION

3.01 PREPARATION
- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe. Remove scale and foreign material, from inside and outside, before assembly. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION
- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
- B. Install standpipe piping, hangers, and supports in accordance with NFPA 14.
- C. Comply with all materials, design and installation requirements of Factory Mutual.
- D. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- E. Install piping to conserve building space, to not interfere with use of space and other work.
- F. Group piping whenever practical at common elevations.
- G. Sleeve pipes passing through partitions, walls, and floors.
- H. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- I. Inserts: Provide inserts for placement in concrete formwork; Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams; Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches; Where concrete slabs form finished ceiling, locate inserts flush with slab surface; Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.
- J. Pipe Hangers and Supports: Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work; Place hangers within 12 inches of each horizontal elbow; Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe; Support vertical piping at every other floor; Support riser piping independently of connected horizontal piping; Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers; Provide copper plated hangers and supports for copper piping.
- K. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- L. Where exposed to view in finished areas, prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- M. Do not penetrate building structural members unless indicated or where approval from the project Structural Engineer has been given in writing.
- N. Provide sleeves when penetrating footings and floors. Seal and fire stop pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- O. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.
- P. Install valves with stems upright or horizontal, not inverted. Remove protective coatings prior to installation.
- Q. Provide drain valves at main shut-off valves, low points of piping and apparatus.

END OF SECTION

SECTION 210548 - VIBRATION AND SEISMIC CONTROLS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Concrete housekeeping pads; Inertia bases for fire pumps; Vibration isolators; Seismic restraints.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. Isolation Technology, Inc; Kinetics Noise Control, Inc; Mason Industries.

2.02 SEISMIC RESTRAINTS
- A. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
- B. Elements: Replaceable neoprene, minimum of 0.75 inch thick with minimum 1/8 inch air gap.
- C. Capacity: 4 times load assigned to mount groupings at 0.4 inch deflection.
- D. Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.

PART 3 EXECUTION

3.01 INSTALLATION
- A. Install in accordance with manufacturer's instructions.
- B. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- C. Support piping connections to equipment mounted on isolators using isolators or resilient hangers for scheduled distance: Up to 4 Inches Pipe Size: First three points of support; 5 to 8 Inches Pipe Size: First four points of support; 10 inches Pipe Size and Over: First six points of support; Select three hangers closest to vibration source for minimum 1.0 inch static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch static deflection or 1/2 static deflection of isolated equipment.

3.02 FIELD QUALITY CONTROL
- A. Inspect isolated equipment after installation and submit report. Include static deflections.

3.03 SCHEDULES
- A. Pipe Isolation Schedule.
  1. 1 Inch Pipe Size: Isolate 120 diameters from equipment.
  2. 2 Inch Pipe Size: Isolate 90 diameters from equipment.
  3. 3 Inch Pipe Size: Isolate 80 diameters from equipment.
  4. 4 Inch Pipe Size: Isolate 75 diameters from equipment.
  5. 6 Inch Pipe Size: Isolate 60 diameters from equipment.
  6. 8 Inch Pipe Size: Isolate 60 diameters from equipment.

END OF SECTION

SECTION 210553 - IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Nameplates; Tags; Stencils; Pipe Markers.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. Brady Corporation; Champion America, Inc; Seton Identification Products.

2.02 NAMEPLATES
- A. Description: Laminated three-layer plastic with engraved letters: Letter Color: White; Letter Height: 1/4 inch; Background Color: Black.

2.03 TAGS
- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
- B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.04 STENCILS
- A. Stencils: With clean cut symbols and letters of following size:
  1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
  2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
  3. 2-1/2 to 6 inch Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
  4. 8 to 10 inch Outside Diameter of Insulation or Pipe: 24 inch long color field, 2-1/2 inch high letters.
  5. Equipment: 2-1/2 inch high letters.
- B. Semi-gloss enamel, colors conforming to ASME A13.1.

2.05 PIPE MARKERS
- A. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
- B. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

PART 3 EXECUTION

3.01 INSTALLATION
- A. Install plastic and plastic tape pipe markers in accordance with manufacturer's instructions.
- B. Identify pumps and valves with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.
- C. Identify valves in main and branch piping with tags.

END OF SECTION

SECTION 210595 - FIRE STOPPING FOR FIRE SUPPRESSION SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Firestopping materials and Firestopping of all penetrations and interruptions to fire rated assemblies, whether indicated on the Drawings, and other openings indicated.

PART 2 PRODUCTS

2.01 FIRESTOPPING ASSEMBLIES
- A. Firestopping: Any material meeting requirements: Fire Ratings: Use any system listed by UL or FM or tested in accordance with ASTM E 814 or ASTM E 119 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and that meets all other specified requirements.

2.02 MATERIALS
- A. Elastomeric Silicone Firestopping: Single or multiple component silicone elastomeric compound and compatible silicone sealant; conforming to the following: Durability and Longevity: Permanent; Color: Manufacturer's standard color; Manufacturers: A/D Fire Protection Systems Inc; 3M Fire Protection Products; Specified Technologies, Inc.
- B. Foam Firestoppping: Single or multiple component foam compound; conforming to the following: Durability and Longevity: Permanent; Color: Manufacturer's standard color; Manufacturers: A/D Fire Protection Systems Inc; 3M Fire Protection Products; Specified Technologies, Inc.
- C. Fiber Packing Material: Mineral or ceramic fiber packing insulation; conforming to the following: Durability and Longevity: Permanent; Manufacturers: A/D Fire Protection Systems Inc; 3M Fire Protection Products; Pecora Corporation; Specified Technologies, Inc; USG.
- D. Firestop Pillows: Formed mineral fiber pillows; conforming to the following: Durability and Longevity: Permanent; Manufacturers: A/D Fire Protection Systems Inc; Grace Construction Products; 3M Fire Protection Products; Nelson Firestop Products; Specified Technologies, Inc.

PART 3 EXECUTION

3.01 PREPARATION AND INSTALLATION
- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Install materials in manner described in fire test report and in accordance with manufacturer's instructions.
- C. Install labeling required by code.

3.02 CLEANING AND PROTECTION
- A. Clean adjacent surfaces of firestopping materials.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 211300 - FIRE-SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. Wet-pipe sprinkler system; System design, installation, and certification.

PART 2 PRODUCTS

2.01 SPRINKLER SYSTEM
- A. Sprinkler System: Provide coverage for entire building unless noted otherwise on the Drawings.
- B. Occupancy: As required by NFPA hazard classifications or as indicated on the Drawings whichever is more stringent.
- C. Water Supply: Determine volume and pressure from water flow test data.
- D. Interface system with building fire and smoke alarm system.
- E. Provide fire department connections in the location(s) indicated on the Drawings and as approved by the local authority.

2.02 SPRINKLERS
- A. All Sprinkler Fusible Links: Fusible solder link type or glass bulb type, temperature rated for specific area hazard.
- B. Suspended Acoustical Ceiling Type: Semi-recessed pendant type with matching push on escutcheon plate; Finish: Chrome plated; Escutcheon Plate Finish: Chrome plated.
- C. Hard Surface Ceiling Type: Recessed pendant type with flush cover plate; Finish: Brass, Chrome or Enamel; Cover and Escutcheon Plate Finish: Chrome or Enamel, color as selected from manufacturer's colors; Adjustment: 1/2" minimum.
- D. Exposed Area Type: Standard upright type; Finish: Brass.
- E. Sidewall Type: Semi-recessed horizontal sidewall type with matching push on escutcheon plate; Finish: Chrome plated or Enamel, color as selected from manufacturer's standard colors; Escutcheon Plate Finish: Chrome plated.
- F. Guards: Finish to match sprinkler finish.

2.03 PIPING SPECIALTIES
- A. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.
- B. Supervisory Switches: As required by NFPA and Local Authorities.

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.
- D. Provide approved backflow preventer assembly at sprinkler system water source connection.
- 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.
- J. Center all sprinklers symmetrically with respect to all soffits, light fixtures, air diffusers and other ceiling features. Approval of the Architect and Engineer at shop drawing review will be required for all sprinkler head layouts. Provide offsets and adjustments as required by the Architect/Engineer's review comments.
- K. 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.
- L. Flush entire piping system of foreign matter.
- M. Install guards on sprinklers where exposed to damage.
- N. Hydrostatically test entire system.
- O. Require test be witnessed by Fire Marshal and authority having jurisdiction.

3.02 INTERFACE WITH OTHER PRODUCTS
- A. Ensure required devices are installed and connected as required to fire alarm system.
- B. Verify that proper power supply is available prior to ordering equipment. Verify proper voltage, phase and current rating of power supply and inform Engineer of any deviations prior to order, connection of equipment or start-up. Responsibility for verification of proper power supply voltage and any product returns or damage resulting from incorrect connections shall rest with this Contractor.

END OF SECTION

Order Plans @ WWW.LDILine.com

PROJECT COORDINATOR

idGROUP
2641 IRVING BLVD.
DALLAS, TEXAS 75207
TEL: 214-638-6800

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FIRE PROTECTION SPECIFICATIONS

DRAWING NUMBER:
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