DIVISION 210000 – FIRE PROTECTION

Latest Edition: 08-08-2024 See Underlined Text for Edits.
(Engineer shall edit specifications and blue text in header to meet project requirements. This includes but is not limited to updating Equipment and/or Material Model Numbers indicated in the specifications and adding any additional specifications that may be required by the project. Also turn off "Underlines")

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 01 Specification Sections, apply to this Division.

1.2 SCOPE:

A. The fire protection contractor shall furnish all labor, material, tools, equipment and services necessary and incidental for installing all fire protection systems shown on the drawings, indicated in the specification, or necessary to provide a finished installation. The finished installation shall be in perfect working condition and be ready for continuous and satisfactory operation. The project area is located in

Note: Engineer to complete above paragraph.

1.3 CODES AND REGULATIONS

A. All materials furnished and all work installed shall comply with the codes and regulations adapted by the State of Maryland and recommendations of the following bodies:

1. International Building Code (IBC)
2. National Fire Protection Association (NFPA)
3. Maryland State Fire Prevention Code

1.4 RESPONSIBILITY

A. The Construction Manager/General Contractor (GC/CM) shall be responsible for all work included in this Division. The delegation of work to other contractors shall not relieve him of this responsibility. Contractors who perform work under this Division shall be responsible to the CM/GC.

1.5 SITE VISIT

A. Prior to preparing the bid, the fire protection contractor shall visit the site and become familiar with all existing conditions. Make all necessary investigations as to locations of utilities and existing field conditions that could affect the work. No additional compensation will be made to the contractor as a result of his failure to familiarize himself with the existing conditions under which the work must be performed.

1.6 OUTAGES

A. For all work requiring an outage, the fire protection contractor shall submit an outage request to the UMB Project Manager, using the UMB Standard Request for Outage Form which is available through the UMB Design and Construction Web Site at: https://www.umaryland.edu/designandconstruction/resources/contractors/

B. The existing mechanical/electrical/fire protection systems shall remain operational unless turned off by University personnel during the construction of the project.

C. Unless otherwise specified, outages of any services required for the performance of this contract and affecting areas other than the immediate work area shall be scheduled at least ten business days (10) days in advance with the UMB Design and Construction Department. Outages shall be performed during normal duty hours. If necessary, some outage work may be performed outside normal hours if approved by UMB.

D. All fire protection outages which will interfere with the normal use of the building in any manner shall be done at such times as shall be mutually agreed upon by the contractor and the UMB Design and Construction Department.

E. The contractor shall include in his price the cost of all premium time required for outages and other work which interferes with the normal use of the building, which will be performed during other than normal work time and at the convenience of the University.

F. The operation of fire protection valves required to achieve an outage must be operated by University personnel only. Unauthorized operation of fire protection valves or other control devices by contractors and their personnel will result in extremely serious consequences for which the contractor will be held accountable.

1.1 DESIGNER/INSTALLER QUALIFICATIONS

A. Designer: Field survey, design, and preparation of the submittals required by the specifications shall be performed and certified by an individual who is a registered professional engineer or who is certified as a Level III or IV Technician by NICET in Water-Based Systems Layout. The designer shall have a minimum of five (5) years' experience in the preparation of sprinkler shop drawings, hydraulic calculations, and field surveying. The system designer shall sign (with certification/license number) each sheet included in the set of drawings.

B. Installer: The field sprinkler foreman shall hold a current valid certification from a nationally recognized sprinkler apprenticeship school or government agency or be recognized as "Journey Level" by a local fire sprinkler labor union. The installing contractor shall be licensed in the State of Maryland.

1.2 SUBMITTALS

A. General: For general requirements see Architectural Specification Division 01 Section "Submittal Procedures". Also comply with the following:

1. UMB requires the Fire Protection Submittal to be submitted electronically as one (1) complete submission as a “pdf” file for review. Partial Submittals will be rejected.

   a. The complete submittal must be reviewed and approved by the A/E and the UMB Fire Marshal before installation can take place.

   b. The warranty information and maintenance manuals shall be included in the Project O & M Manual.

2. Submittal approval does not relieve the contractor of their responsibility to provide a code compliant system. Any installation by the contractor that does not meet code or specification requirements shall be corrected to be in full compliance at no cost to the University.

3. Fire protection shop drawings (working plans) must be developed by computer software. Fire protection shop drawings (working plans) submitted for review that are hand drawn or have handwritten notes will be rejected.

4. The sprinkler contractor shall not deviate from the approved sprinkler layout drawings unless written approval has been obtained from the UMB Fire Marshal.

5. Where deviations are approved by the UMB Fire Marshall or as necessary by field conditions, the contractor shall record on one (1) set of prints, the installed locations, sizes, and depths of pipes, services, equipment, etc. which may differ from the approved fire protection shop drawings (working plans). When the sprinkler work has been completed and accepted by UMB and all deviations have been recorded the sprinkler contractor shall scan the prints as a color pdf file.

6. Submittal approval does not relieve the contractor of their responsibility to provide a code compliant system. Any installation by the contractor that does not meet code or specification requirements shall be corrected to be in full compliance at no cost to the University.

7. Electronic Fire Protection Submittal: Fire protection submittal shall include the product data listed in paragraphs below. The complete submittal must be reviewed and approved by the A/E and the UMB Fire Marshal before installation can take place.

8. Product data shall include the following items unless otherwise noted:<Edit List for Project Requirements>
   a. Article 2.3, Fire Stops & Smoke Seals for Wall and Floor Sleeve Applications
   b. Article 2.4, Sprinkler System Pipe, Fittings, and Joints
   c. Article 2.5, Pipe Sleeves
   d. Article 2.6, Sprinklers
   e. Article 2.7, Identification and Leak Testing
   f. Article 2.8, Hangers and Supports
   g. Article 2.9, As-Built Drawing Do not include this data in the Fire Protection Submittal.
   h. Article 2.10, O & M Manuals Do not include this data in the Fire Protection Submittal.
   i. Warranties and maintenance instructions shall be included in the O & M Manual only. Do not include this data in the Fire Protection Submittal.

9. Additional Data: Subject to project requirements, in addition to the product data indicated in the paragraph above the following additional data may be required: <Coordinate with UMB, delete if not required >
   a. Fire Protection Shop Drawings (working plans)
   b. Hydraulic Calculations
   c. Fire Flow Test Report
   d. Samples (only when requested by the A/E or UMB)

10. Submittal File Format: File formats and names for each submittal shall be electronically as follows:

    a. File Formats:
       1) Product Data: “pdf” file format.
       2) Design Shop Drawings: “pdf” and “dwg” file formats.
       3) Coordinated Drawings: “pdf” or “dwg” file formats.
       4) Schedules: “xl” file format.

11. Aside from the electronic submission, fire protection shop drawings (working plans) must also be submitted as a full size hard copy to the UMB Fire Marshal. All requirements from the “Working Plans” Section of NFPA 13 must be met.

1.3 IDENTIFICATION BADGES

A. Contractors must obtain photo identification cards for all employees who will be at the construction site. The University will charge the contractor $25.00 for each badge as a deposit of which $20.00 will be returned when the badge is returned. Lost photo I.D. card will cost $25.00 for another replacement card. (The above charges are subject to change without notice.)

1.4 HAZARDOUS MATERIALS

A. Identification and removal of hazardous materials (asbestos, lead paint, PCBs) is not part of this contract. If questionable material is encountered, notify the University Project Manager and the University Environmental Health and Safety Department in writing immediately. The University shall then arrange for investigation and possible abatement of the material. Contractor shall schedule his work to accommodate hazardous material removal by the Owner.

1.5 WARRANTY/GUARANTEE

A. All materials, equipment, etc. provided by the general contractor and/or his subcontractors shall be warranted and guaranteed to be free from defects in workmanship and materials for a period of two (2) years from the date of substantial of completion and acceptance of work by UMB. Any defects in workmanship, materials, or performance which appear within the guarantee period shall be corrected by the contractor without cost to the owner, within a reasonable time, to be specified by UMB. In default thereof, owner may have such work done and charge the cost of same to the contractor.

PART 2 – PRODUCTS

2.1 LISTED MANUFACTURERS

A. Listed Manufacturers: The manufacturers indicated in Part 2 represent the basis for design and identify the minimum level of quality for materials and equipment, specified in this Division, that are acceptable to UMB. Unless “or equal” is included as an option, substitutions are not allowed, except under the following condition. During bid phase, contractors may submit material and equipment by non-listed manufacturers provided said submittals meet the requirements of these specifications. All submitted materials and equipment are subject to approval by the A/E and UMB. Reference: Division 1 Substitution Section.

2.2 GENERAL REQUIREMENTS

A. Sprinkler system design, installation and water supply requirements shall be designed to a minimum hazard classification of Ordinary Hazard (Group 1), unless otherwise approved by the UMB Fire Marshal.

B. All modifications to existing sprinkler systems shall be performed in accordance with the edition of NFPA 13 which is applicable within the State of Maryland at the time of contract execution and as approved by the UMB Fire Marshal.

C. The Contractor shall be responsible for replacing all products and material that were installed that were not included in the approved submittal.

2.3 FIRE STOPS &, SMOKE SEALS FOR WALL & FLOOR SLEEVE APPLICATIONS

A. General: Provide fire stops, and smoke sealant materials for all fire protection services penetrating through rated assemblies. See Architectural Specification Division 07, Section "Penetration Firestopping" for sealant material requirements. Services include:

1. Fire protection penetrations include piping.

B. New Construction: All new penetrations shall be provided with a pipe sleeve and sealant materials.

C. Existing Construction: All new service penetrations through existing rated assemblies shall be provided with a pipe sleeve and sealant materials. All existing unsealed penetrations for services passing through existing rated assemblies within the project area shall be provided with sealant materials.

D. Project Area: The project area shall include the finished spaces and related sections of the utility shafts within the project area footprint.

E. Wall Pipe Sleeve Applications: Pipe sleeves shall be required for all new pipe penetrations through rated wall assemblies and non-rated CMU walls. Where pipe sleeves are installed in non-rated CMU walls fire rated sealant materials are not required. Provide acoustical caulking to seal the annular spaces between the sleeve and the bare pipe or pipe insulation on each end with one half (1/2) inch caulking all around the annular space.

F. Floor Pipe Sleeves Applications: Pipe sleeves are required for all new pipe risers passing through floor slabs.

2.4 SPRINKLER SYSTEM PIPE, FITTINGS, AND JOINTS

A. General: All pipe, fillings, joints, and couplings used for standpipe and sprinkler systems shall be as follows:

1. Piping: All piping shall be the product of one (1) manufacturer. Piping one (1) inch and larger shall be provided with antimicrobial coating to limit corrosion from microbes on the interior of the pipe. Acceptable manufacturer for sprinkler piping is Wheatland Tube Company or approved domestic equal.

2. Fittings, Couplings and Gaskets: All grooved fittings, couplings and gaskets shall be the product of one (1) manufacturer. Grooving tools shall be of the same manufacturer as the grooved components. Acceptable manufacturers for grooved fittings, couplings and gaskets are Victaulic or Gruvlok with Victaulic products as the basis of design.

3. The Contractor shall be responsible for replacing all products and material that were installed and was not included in the approved submittal.

B. Pipe Material: All piping shall be Grade A or Grade B, Schedule 40 black steel pipe manufactured in the United States as follows:

1. Piping one and one half (1-1/2) inch and smaller shall conform to Type 'F' Grade 'A' Schedule 40 black steel pipe per ASTM A53 with threaded ends. Threads shall be per ANSI B.1.20.1.

2. All two (2) inch piping shall conform to Type 'E' Grade 'B' Schedule 40 black steel pipe per ASTM A53. Two (2) inch piping shall be either thread end type per paragraph 1 above or rolled grooved end type per paragraph 3 below. (Contractor Option)

3. Piping two and one half (2-1/2) inch and larger shall conform to Type 'E' Grade 'B' Schedule 40 black steel pipe per ASTM A53 with rolled grooved ends.

C. Fitting Material: Comply with the following:

1. Threaded Fittings: Fittings for piping one and one half (1-1/2) inch and smaller shall be threaded Class 125 cast iron fittings as manufactured by Anvil / ASC Engineered Solutions or approved domestic equal.

2. Fitting Options: Fittings for two (2) inch piping shall be either threaded Class 125 cast iron per paragraph 1 above or ductile iron grooved end fittings per paragraph 3 below. (Contractor Option)

3. Grooved Fittings: Fittings for piping two and one half (2-1/2) inches and larger shall be ductile iron grooved end fittings. Fittings shall be short pattern, with flow equal to standard pattern fittings.

D. Joints, Couplings, Mechanical T's and Gaskets: Comply with the following:

1. Joints:

a. Joints for piping one and one half (1-1/2) inch and smaller shall be Threaded Joints conforming to American Standard for Pipe Threads ANSI B2.1.

b. Joints for two (2) inch piping shall either be Threaded Joints per paragraph 'a' above or Rolled Groove Joints with Couplings per paragraph 'c' below. (Contractor Option)

c. Joints for piping two and one half (2-1/2) inch and larger shall be Rolled Groove Joints with Couplings.

2. Couplings:

a. Couplings for rolled grooved piping shall be Victaulic Style 009N two (2) Bolt Installation Ready Coupling with offset angled bolt pads to accomplish rigidity and provide support in accordance with NFPA 13. Couplings shall be fully installed at visual pad to pad offset contact. Couplings that require gapping of bolt pads or specific torque ratings for proper installation are not permitted.

b. Where seismic design requirements are applicable, provide Victaulic Quick Vic Flexible Coupling Style 177N.

3. Mechanical-Ts:

a. For piping smaller than 2", provide Victaulic FireLock Outlet-T Style 922.

b. For piping larger than 2", provide Victaulic Mechanical-T Bolded Branch Outlet Style 920.

c. For 2" piping, either the Victaulic FireLock Outlet-T Style 922 or Victaulic Mechanical-T Bolded Branch Outlet Style 920 is acceptable.

4. Gaskets: Gasket Material shall be as follows:

a. Wet Systems: Grade 'EHP' EPDM.
b. Dry Systems: Grade 'E' Type 'A' EPDM.

2.5 PIPE SLEEVES

A. Steel Pipe Sleeves: Steel pipe sleeves shall be standard black steel pipe Type E, Grade B, with plain ends conforming to ASTM A53/A53M.

B. Cast Iron Pipe Sleeves: Cast iron pipe sleeves shall be standard weight cast iron pipe with plain ends conforming to ASTM A74 and CISPI – 301.

2.6 SPRINKLERS <Edit for Project: A/E to select type of sprinkler>

A. General: Sprinklers shall be listed by UL and only new sprinklers shall be installed. Sprinklers shall be located and installed in accordance with NFPA 13 and properly coordinated with all other work.

B. Damage to Sprinklers: Any sprinkler that incurs damage, is painted, sprayed, caulked, or covered with any material before the system is accepted by the University shall be replaced

by the contractor at no cost to the Owner. Protective sprinkler caps cannot be removed until after the ceiling is in place, or sprinklers will be subject to replacement.

C. Basis of Design: The basis of design shall be sprinklers manufactured by Viking or others as permitted below.

D. Temperature Ratings: The temperature rating of every sprinkler shall be in accordance with NFPA 13 and based upon the maximum anticipated ceiling temperature.

E. Sprinkler Guards: Wire-cage type, including fastening device for attaching to sprinkler. Guards shall be specifically listed for the sprinkler on which they are being installed. Guards shall be installed wherever sprinklers are potentially subject to damage. Guards shall be installed on all upright sprinklers located at the base of stairwells, on all sprinklers under ductwork, and on all sprinklers installed less than six (6) feet – eight (8) inches above the finished floor.

F. Spare Sprinklers: The spare sprinklers shall correspond with each type of sprinkler and temperature rating that was installed in the project. Provide the necessary wrench(s) for each of the type sprinkler installed. Provide spare quantities as follows:

Type of Sprinklers Installed:	Minimum Spare Sprinklers:
1-10	1
11-50	2
51-100	3
101-500	4
501+	6

In no case shall the total number of spare sprinklers provided be less than the number required by NFPA 13.

G. Coverage: Except for high hazard areas, all sprinklers shall be quick response standard coverage type sprinklers with a 'K' Factor of 5.6, unless prohibited by Code or otherwise directed by the UMB Fire Marshal. Only the listed sprinklers below may be installed, unless specific project requirements dictate a different type of sprinkler:

1. Pendant Sprinklers: Where pendant sprinklers are required, provide Viking VK3021 - Horizon Quick Response Flush Pendent Sprinkler and push on escutcheon with a white polyester finish to match ceiling.

2. Side Wall Sprinklers: Where sidewall sprinklers are required, provide Viking VK305 - Microfast Quick Response Horizontal Sidewall Sprinkler and escutcheon with a white polyester finish to match walls.

3. Upright Sprinklers: Where upright sprinklers are required, provide Viking VK3001 - Microfast Quick Response Upright Sprinkler with a chrome finish.

4. Corrosive Areas: Where sprinklers installed in corrosive areas provide Viking VK130 (Upright) or VK132 (Pendent) - Micromatic Stainless Steel Sprinkler.

5. Cold Rooms: In each new cold room provide Viking 200ºF dry pendent Model VK176 Adjustable Sprinkler with a chrome finish.

6. Concealed Sprinklers: Where concealed sprinklers are required, provide Viking VK4621 Quick Response Concealed Pendent Sprinkler and push on escutcheon with a white finish to match ceiling.

7. If existing to remain sprinklers are present in the same compartment as new sprinklers, the existing sprinklers are not one of the models specified above, the new sprinklers shall match the type and style of the existing sprinklers.

2.7 IDENTIFICATION, & PIPE HYDROSTATIC/LEAK TESTING

A. General: Provide all supports, identification, and hydrostatically leak testing for all piping systems indicated on the drawings, details and as specified below.

B. Identification Products for Fire Protection Systems: Identification products for Fire Protection Systems shall include pipe labels and ceiling markers conforming to ANSI/ASME A 13.1, OSHA and NFPA requirements for letter/color combinations from one (1) of the following manufacturers or approved equivalent as follows:

1.Seton Fire Protection Signage
2.Craft Mark Fire Protection Signage
3.Reliable
4.Tyco
5.Kroy

C. Pipe Labels: Provide pretensioned, preformed semi-rigid vinyl or plastic pipe labels to partially cover or cover full circumference of pipe and to attach to pipe without adhesive.

1. Label Material: Comply with the following:

a. Vinyl Formed Labels:

1) External diameters up to two (2) inches – 20 mil vinyl.
2) External diameters up to two and one half (2-1/2) inches – 30 mil vinyl.

b. Plastic Formed Labels: per manufacturer's recommendations.

2. Flow Direction Arrows: Integral with piping-system service lettering to accommodate both directions and as separate unit on each pipe label to indicate flow direction.

3.Lettering Size:

a. Pipe Size Less Than One and One Half (1-1/2) Inch in Diameter: Label shall be at least three quarter (3/4) inches high.

b. Pipe Size One and One Half (1-1/2) Inch to Two Inch (2) in Diameter: Label shall be at least one and one half (1-1/2) inches high.

c. Pipe Size Two and One Half (2-1/2) Inch in Diameter and Larger: Label shall be at least two and one quarter (2-1/4) inches high.

d. Pipe-Label Colors:

1) Background Color: Red.
2) Letter Color: White.
3) Lettering: (Wording for items B & C may need to be custom ordered)

a) "Fire Sprinkler"
b) "Dry Fire Sprinkler"
c) "Pre-Action Fire Sprinkler"
d) "Drain"
e) "Standpipe"

D. Ceiling Grid and Access Panel Markers: Provide Kroy type clear adhesive printed labels with three sixteenth (3/16) inch high letters to identify the location and type of concealed valves and sprinkler system components.

1. Ceiling Marker Data: For Fire Protection printed data shall be as follows:

a. FP Valve – Low Point Drain.

E. Pipe System Hydrostatic/Leak Test:

1. Perform hydrostatic testing in accordance with NFPA 13.

2.8 HANGERS AND SUPPORTS

A. Provide hangers and supports in compliance with NFPA 13.

2.9 AS BUILT DRAWINGS

A. For requirements see Part 3.

2.10 PROJECT OPERATION AND MAINTENANCE MANUAL ELECTRONIC FILES

A. Project O & M Manual File: The project OM Manual shall include one (1) electronic copy of each approved submittal and any manufacturer's maintenance manuals, and all warranty certificates included in this Division. Also include the address, phone number and contact person for each supplier. Using the UMB Standard O&M Manual Template referenced in Division 01 Closeout Procedures insert the submittal files include both a book mark and tree structure for accessing each submittal file in the manual.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. In no case shall the existing fire protection system be placed out of service for more than eight (8) hours in a twenty four (24) hour period without the written approval of the UMB Fire Marshal. Contractor shall be responsible for performing a fire watch for outages greater than eight (8) hours.

B. Install all pipe, fittings, valves, controls, hangers and other components in accordance with NFPA 13.

C. The work under this contract shall be coordinated with that of all trades so that all work may be installed in the most direct and workmanlike manner, and so that interference between piping, ducts, equipment, architectural and structural features will be avoided.

D. All construction work that creates excessive noise will not be permitted during normal business hours. See Division 01 Specification Section "Cutting and Patching" for requirements.

3.2 CONNECTIONS AND ALTERATIONS TO EXISTING WORK

A. When existing fire protection work is removed, all pipes, valves, fittings, etc. shall be removed back to the active mains and capped. Plug and remove existing piping at the last active sprinkler.

B. Removal and/or relocation of existing services shall be closely coordinated with Facilities Management if they impact adjacent areas which shall remain operational.

C. While performing connections and alterations to existing fire protection work, the contractor shall take extreme care to protect all existing materials, equipment, casework etc. from dirt, debris, and damage. Any damage caused by the contractor to existing materials, equipment, casework, etc. shall be repaired to UMB's satisfaction and specifications at the contractor's expense.

3.3 CUTTING AND PATCHING

A. Cutting and patching associated with the work in the existing structure shall be performed a neat and workmanlike manner. Existing surfaces that are damaged by the contractor shall be repaired or provided with new materials to match existing.

B. Structural members shall not be cut or penetrated. Holes cut through concrete and/or masonry to accommodate new work shall be cut by reciprocating or rotary, non-percussive methods.

C. Patching of areas disturbed by installation of new work and/or required demolition shall match existing adjacent surfaces as to material, texture and color.

3.4 CUTTING, WELDING, BURNING

A. Before the contractor and/or any sub-contractor commences any cutting, welding, burning or other type of hot work at UMB, the contractor must request a Hot Work Permit from the UMB Office of the Fire Marshal. Hot Work Permits must be requested online at https://www.umaryland.edu/fire-marshal/hot-work-permits/ at least one (1) day before beginning hot work.

B. The hot work permit copy shall remain on the job site at the hot work location until such work is completed.

3.5 PIPE SLEEVE INSTALLATIONS <Edit for Project Requirements>

A. Fire Rated Walls: Where new and/or existing fire protection piping passes through rated walls provide pipe sleeves with required fire sealant materials to maintain the rating of the wall assembly.

1. Use standard weight steel pipe or service weight cast iron pipe for pipe sleeves. Where sleeves are installed in floors and load bearing walls, use only standard weight steel pipe for pipe sleeves.
2. Provide a minimum of one half (1/2) inch annular space clearance around the entire circumference of the pipe passing through the sleeve and between the pipe sleeve and the surface of the core drilled hole.
3. Center pipe passing through sleeve.
4. The entire annular spaces must be sealed with fire and waterproof sealant.
5. Sleeves in walls must be installed flush with both finished wall surfaces.
6. In finished areas provide an escutcheon plate around the bare pipe passing through the assemblies to conceal the sleeve and sealant.

<Engineer Note: Where openings in walls for pipe sleeves are large enough to require additional structural supports such as lintels the A/E team shall coordinate the additional wall supports with structural engineer>

B. Fire Rated Floors: Where new and/or existing fire protection piping passes through rated walls provide pipe sleeves with required fire sealant materials to maintain the rating of the wall assembly.

1. Use standard weight steel pipe for pipe sleeves.
2. Provide a minimum of one half (1/2) inch annular space clearance around the entire circumference of the pipe passing through the sleeve and between the pipe sleeve and the surface of the core drilled hole.
3. Center pipe passing through sleeve.
4. The entire annular spaces must be sealed with fire and waterproof sealant.
5. Sleeves must be installed with top of sleeve one (1) inch above the finished floor surface. The bottom of the sleeve must be flush with the finished surface of the underside of the floor assembly.
6. In finished areas provide an escutcheon plate around the bare pipe passing through the assemblies to conceal the sleeve and sealant. If a riser clamp is in place, omit the escutcheon.

C. Sealant Requirements: Comply with requirements for sealants specified in Part 2.

D. Fire-Barrier Penetrations: Comply with requirements for firestopping specified in Part 2.

E. Non-Fire-Rated Soundproof Partition Penetrations: Where new and existing piping pass through interior partitions with sound proofing provide a pipe sleeves. Seal the annular spaces between construction openings, the sleeves, the pipe and/or pipe insulation with soundproof insulation material equal to the width of the opening. The soundproof insulation shall match the insulation in the partition. <Delete if not required>

3.6 INSTALLATION – SPRINKLER PIPING

A. In areas with suspended ceilings all sprinkler piping shall be concealed. Piping shall be installed and arranged to protect it from freezing and corrosion and shall be pitched for drainage.

B. All sprinkler piping shall be substantially supported from the building structure which must support the added load of water filled pipe plus a minimum of two hundred fifty (250) pounds applied at the point of hanging in accordance with NFPA 13.

C. Install all vertical sprinkler piping systems level and parallel to the building walls, ceilings, and partitions.

D. Sprinkler Main and Branch Piping: All new sprinkler main and branch piping shall comply with the following:

1. All new sprinkler main and branch piping shall be installed level and parallel to walls, matching work by other trades.
2. Where horizontal sprinkler piping offsets to clear obstructions such as ductwork, structural members and work installed by other trades provide low point drain valves in locations where they can be accessed.

E. Pipe and Connections for Sprinklers: Sprinkler Pipe and connections for Sprinklers shall comply with the following requirements:

1. When reusing existing sprinkler branch piping, the sprinkler pipe runout connections located on the bottom of the existing branch piping are permitted to be reused when relocating sprinklers. Return bends are not required for new sprinkler runout piping.
2. Mechanical T-s in new piping and/or added to existing sprinkler piping must be made with the outlet on the top or side of the piping.
3. All new sprinkler branch piping must be connected to the top or side of the existing or new sprinkler main.
4. All new sprinkler runout pipe connections serving individual sprinklers must be made off the top or side of the sprinkler branch piping unless otherwise noted above.
5. Sprinkler Runout Piping – Existing Branch Piping: New sprinkler runout pipes connecting to existing branch piping can be installed diagonally to or perpendicular to the existing branch piping.
6. Sprinkler Runout Piping – New Branch Piping: New sprinkler runout pipes connecting to new branch piping shall be installed perpendicular to the new branch piping.

F. Drains: All risers, including the alarm check valve, shall be equipped with drains sized as specified in NFPA 13. The alarm check valve drain (main drain) shall be piped to the outside of the building or to a Storm Water Sump with Pumps approved for the purpose by the Engineer and the UMB Fire Marshall. A supplementary drain of equal size shall then be provided for test purposes with free discharge, located at or above grade. An extra valve shall be installed in the line to the sump in order to close the line during tests.

3.7 PIPE JOINTS

A. Grooved Joints: Install in accordance with the manufacturer's latest published installation instructions. Pipe ends shall be clean and free from indentations, projections and roll marks in the area from pipe end to (and including) groove. Gasket shall be manufactured by the coupling manufacturer and verified as suitable for the intended service. A factory trained representative (direct employee) of the coupling manufacturer shall provide on-site training for contractor's field personnel in the use of grooving tools, application of groove, and product installation. The representative shall periodically visit the job site and review installation to ensure best practices in grooved joint installation are being followed. Contractor shall remove and replace any improperly installed products.

3.8 INSTALLATION – SPRINKLERS

A. Center sprinklers in ceiling tiles and coordinate location with all other trades, including but not limited to ceilings, lights, diffusers, grilles etc.

B. In finished areas where more than two (2) sprinklers are installed, the deflectors of all sprinklers shall be installed at the same elevation from the finished floor.

C. New Sprinklers shall be installed using new rigid pipe for the sprinkler runout piping. See paragraph 3.6 for piping requirements

3.9 INSTALLATION – PIPE LABELS

A. Install or permanently fasten labels on each major item of sprinkler equipment.

B. Clean piping and equipment surface of substances that could impair bond of identification devices which may include dirt, oil, grease, release agents, incompatible primers, paints, and encapsulants.

C. Pipe Labels: Provide pipe labels for all exposed and concealed piping. Locate pipe labels as follows:

1. In spaces without ceilings position pipe labels so they are visible from the floor.
2. In concealed spaces above suspended ceilings and in utility shafts position pipe labels so they are visible from an access point.
3. Spaced at maximum intervals of twenty five (25) feet along each run of the sprinkler main.
4. Near the midpoint of each branch pipe serving more than one (1) sprinkler.

D. Piping Color Coding: Where indicated painting of fire protection piping shall follow the requirements in Architectural Specification Sections for “Interior Painting” and/or “High Performance Coatings”. < Coordinate with UMB – D & C, Delete if not required>

3.10 INSTALLATION, TEST AND ACCEPTANCE

A. Installation, Tests, And Acceptance: <Edit for Project>

1. Installation, testing, and final acceptance shall be in accordance with all applicable codes, and the requirements of the University and the UMB Fire Marshal.

2. All required test shall be performed by the fire protection contractor as part of this contract. The fire protection contractor shall see those proper representatives of the Owner, the Engineer, UMB Fire Marshal, Design and Construction Department and

any other personnel desiring to witness the tests shall be notified at least five (5) days prior to the scheduled test time.

3.11 CONSTRUCTION RECORD DOCUMENTS

A. Upon completion of the work, the sprinkler contractor shall transmit to the A/E one (1) set of marked up prints as a colored pdf file and one (1) electronic CAD file in the latest Auto Cad Release edition used by UMB with All "As Built Drawing" information neatly recorded thereon in red. The A/E shall verify that all “Record Drawing” information has been recorded on the electronic CAD file. The electronic CAD file and mark up pdf file shall be transmitted to UMB by the A/E.

B. At a minimum, the following installed conditions shall be recorded:

1. Location of all low point drain valves with assigned valve tag numbers.

3.12 CLEAN – UP

A. Excessive debris and dirt, such as occurs from cutting through masonry or plaster walls shall be cleaned up from the equipment and removed immediately after the work of cutting through the walls.

B. Debris shall be removed from UMB property.

C. Ceiling Tiles: Ceiling tiles in finished areas shall not be installed/replaced until all inspections have been completed and accepted.

D. All areas shall be left broom-clean at the end of the work period.

3.13 COMPLETED HYDROSTATIC/LEAK TEST FORMS

A. Upon completion of each hydrostatic/leak test, the contractor shall upload the signed leak test forms to the Project File, in ebuilder, in Folder 11.06 Test Reports.

3.14 UMB STANDARD HYDROSTATIC/LEAK TEST SUMMARY FORMS

A. General: Contractor shall use the “UMB Standard Pipe System Hydrostatic/Leak Test Summary Form.

1. Sample Form: The following page contains a sample of the UMB Standard Pipe System Hydrostatic/Leak Test Summary Form.

2. Availability: The standard test summary form is available on the UMB Web Site at:
https://www.umaryland.edu/designandconstruction/resources/contractors/

3. Field Testing: For field testing download and copy the forms from the UMB web site. <Do not use attached "Sample Forms" for testing>

UMB STANDARD PIPE SYSTEM HYDROSTATIC/LEAK TEST SUMMARY FORM

TEST DATA:

Date: _____ Project Number: _____

Location: _____

Pipe System Tested (Service): _____

Location and Description: _____

Pipe Materials: _____

Operating Pressure: _____

Specified Test Pressure: _____

Actual Test Pressure: _____

Pressure Test Type: _____

Test Start Time: _____ Recorded Test Pressure: _____

Test Completion Time: _____ Recorded Test Pressure: _____

Test Duration: _____ Pressure Drop or Rise: _____

Test Result (Pass/Fail): _____

SIGNATURES:

Construction Manager: _____

Construction Manager Representative: _____

Mechanical Contractor: _____

Mechanical Contractor Forman: _____

UMB Division: _____

UMB Witness: _____

Remarks: _____

END OF DIVISION 210000