

SECTION 15300 – FIRE PROTECTION

PART 1 – GENERAL

- 1.1 General: This section consists of providing fire protection systems. Automatic sprinkler systems shall be provided in all new, modernization, and large additions to school buildings.
- 1.2 PERMITS, CODES & STANDARDS: An Automatic sprinkler system shall be designed, installed, tested and approved for the entire building in accordance with Montgomery County School standards, NFPA codes, state codes, locals jurisdiction's requirements and contract documents.
- 1.3 APPROVALS: The automatic sprinkler system shall be tested in accordance with NFPA 13 and be approved by the Montgomery County Fire Marshal.
 - A. All hydrostatic tests shall be performed with plugs prior to sprinkler head installation.
- 1.4 GUARANTEE: Specify that the contractor shall guarantee and service all workmanship and materials within the period of two years after the date of final acceptance. The contractor shall be responsible for, and pay for any damages caused by, or resulting from defects, in any of the work.
- 1.5 COORDINATED SHOP DRAWINGS: The sprinkler contractor must participate in developing the required coordinated drawings with other contractors, prior to any work.

PART 2 – PRODUCTS

2.1 Fire Sprinkler System

- A. Layout of plans and preparation for automatic fire sprinkler systems shall be prepared under the supervision of one of the following:
 1. The designated qualified individual employed by a fire sprinkler contractor who meets the qualification listed for the appropriate license classification under the Maryland State Fire Code
 2. A Maryland registered professional engineer, knowledgeable in areas about fire sprinkler systems.

The final design including sizing of piping, pumps, and location of the sprinkler heads shall be performed by the fire sprinkler contractor and approved by the fire marshal of Montgomery County following MCPS review.
- B. Plans shall be marked with the fire sprinkler contractor license number and one of the following:
 1. The designated qualified individual's original signature, NICET level, certification number, and expiration date; or
 2. The original signature and seal of a professional engineer who is registered in Maryland.
- C. Delineate on the drawings special conditions such as atria; open ceilings, or architecturally sensitive areas; loading docks and exterior canopies etc. which may have an impact on sprinkler design and installation.
- D. Determine and identify on drawings the location of fire pump, risers, all valves, fire department connections, drains, and points of connection.
- E. Test or drain lines shall discharge to the exterior of the building, shall be kept away from entrances, shall not discharge onto loading docks, and shall discharge onto finished grade.
- F. Design wet pipe sprinkler systems, unless installed in areas subject to freezing. Dry pendant or sidewall sprinklers, dry pipe, or antifreeze systems may be used in areas subject to freezing. Propylene glycol shall be used if antifreeze systems need to be installed. Do not use pre-action type systems.
- G. Sprinkler systems shall be hydraulically calculated by an approved design allowed by NFPA 13. Pipe schedule systems may be used for extension of existing pipe schedule systems where water supply is adequate. Sprinkler systems shall be designed based on available water supply without the fire pump operating, where possible. A safety factor shall be included by calculating the

demand to a point no greater than 10% below the available water supply curve. Or, a ten percent safety factor shall be provided (subtract 10% from the available water supply curve) for each sprinkler demand including the required hose streams.

- H. Distribution installation shall comply with NFPA 24. Piping shall be black steel standard wall Schedule 40 pipe with threaded malleable iron fittings; Schedule 10 with mechanical joints may also be used.
- I. Sprinkler valves shall be U.L. listed and approved indicating valves, suitable for 175 PSI. Valves 2-1/2" and larger to be brass body and stem, 2" and smaller brass body, brass stem and seat.

2.2 Sprinkler Heads:

- A. All heads to be orifice with 165°F temperature ratings, per code. All heads shall be recessed chrome plated with chrome plated escutcheon plates and shall be quick response type. Brass heads in unfinished areas are accepted. Use self-closing, auto resetting type heads in toilets and similar spaces. Require sprinkler head guards in play areas such as gyms and multi-purpose rooms. Sprinkler heads located within two feet of any heating equipment shall substitute ratings to 265°F.
- B. Standard heads accepted manufacturers: Pedant or upright: Viking Corporation "Pendant" or "Upright" Model C, Star Model E, or Central Model A, or Grinnell, Reliable Automatic, or Victaulic shall be acceptable.
- C. The sprinkler heads in ceilings shall be installed in center of the ceiling tile at the lateral dimension one third, one third, one third, on the width dimension.

2.3 Standpipe and Fire Hose Connections:

- A. Standpipes shall be installed in all buildings where required by NFPA 101, NFPA 45, or NFPA 1.
- B. Install Class I hose connections per NFPA 14.
- C. Wet standpipes are preferred.
- D. Flow and pressure requirements shall comply with NFPA 14.

2.4 Piping Accessories:

- A. Specify that all hangers must be approved by NFPA and U.L. listed. Hangers shall also be provided at every change in direction, and for all drops. Hang pipes only from top cord of joist
- B. Require iron pipe sleeves of ample diameter at all points where pipes cut beams, floors or walls. Unions in iron or steel piping shall be ferrous metal ground joint type, having brass seats. Connections 2-1/2" and larger shall be flanged. A dielectric union shall be used at connections between ferrous and non-ferrous piping.
- C. Provide on each sprinkler control valve, identification tags indicating the portion of the system controlled by each valve. Also, provide an approved valve chart in frame and glass cover showing location and use of each valve. All control valves shall be provided with tamper switches to electrically monitor position of valve. Drain valves with threaded hose end shall be installed at low points.

2.5 Water Supply: Assess adequacy of the new or existing water supply. Perform water supply flow testing of fire hydrants and/or fire pumps. Prior to the design development submittals, the plumbing and site engineers shall provide the hydraulic and volume calculations to WSSC.

2.6 Fire Pump:

- A. When a fire pump is necessary to supplement fire flow and pressure, size it to comply with NFPA 13 and 14.
- B. Fire pumps shall be separated from all other areas of the building by fire resistant rated construction in accordance with NFPA 20. The fire pump shall be in a separate room from other mechanical and electrical equipment.

- C. Design the fire pump installation to comply with the details located with NFPA 20. Provide a test header and a flow meter. The test header is to be piped to an exterior straight type header that can be tested without damaging landscaping, etc. Provide a bypass with normally open valves. All fire pump system valves shall be electrically supervised by tamper switches.
 - D. Pumps shall start automatically at 10 psi below jockey pump start pressure. Pumps shall be manually shut down.
 - E. Provide jockey pumps to supply no less than 60 gpm. This will allow the jockey pump to supply the flow equivalent of one sprinkler to permit water flow switch testing and will permit tests to be performed without shutting down the fire pump. The jockey pump shall maintain pressure as required to prevent the fire pump from operating to maintain system pressure.
- 2.7 Fire department siamese connections shall be provided in accordance with local fire department regulations. The siamese connections shall be U.L. listed with check valve, ball drip, and threads to match those used by local Fire Department. Provide chrome face plate with letters to read "AUTOMATIC SPRINKLER".
 - 2.8 Signs and Placards: Provide permanently attached placards at each fire department siamese pumper connection, identifying the hydraulically designed automatic sprinkler system and indicating information, as required by local fire departments. Signs shall indicate maximum pumping pressure not to be exceeded.
 - 2.9 Specify that the sprinkler system to be furnished with a spare sprinkler cabinet, wrench, and numbers of spare sprinklers.

PART 3 – EXECUTION

- 3.1 The plumbing contractor is responsible for installation of back-flow preventer at maximum 4 ft. AFF, to include OS&Y valve (only inlet and outlet of back flow preventer). Connection of the sprinkler line shall start at the outlet end of back-flow preventer directly off the main water pipe. The sprinkler contractor is responsible from this point on. The sprinkler contractor will be responsible for tamper switches on control valves on the backflow.
- 3.2 The fire protection engineer shall include a performance specification for the sprinkler system along with drawings that include provisions for locations of sprinkler risers, stand pipes, etc. All sprinkler pipe to be concealed, if pipe can not be concealed the owner and mechanical engineer must be notified before proceeding. The system shall also be zoned in accordance with the fire alarm system in accordance with NFPA Fire codes.
- 3.3 Fire Department (Siamese) connection shall be within 100 feet of a fire hydrant preferably on a side of the building clearly accessible on site. The Siamese connection can be located near the property line if a fire hydrant is not within the 100 feet radius.
- 3.4 For addition projects, all new sprinkler service(s) must connect at the main sprinkler manifold in lieu of tapping into an existing zone line.
- 3.4 Fire Marshall's office shall be contacted for any fire hydrant that is determined to be required on or adjacent to the site during the schematic design phase of the project.
- 3.5 The sprinkler contractor shall provide training and a walk through demonstration for MCPS operations and maintenance personnel.
- 3.6 Testing: No sprinkler heads shall be installed until the piping has been flushed, tested and approved. In addition to any tests that might be required by the approving authorities, the entire sprinkler system is to be hydrostatically tested for a period of two hours, in line with local codes.

END OF SECTION