

 HARVARD MEDICAL SCHOOL	FACILITIES DESIGN STANDARD CONSTRUCTION/RENOVATION	SOP #: HMS_DS_FIRE PROTECTION_EBS_170527
TITLE: Division 21 Fire Protection- Existing Building Systems		REVISION: May 27, 2017

21 0510 – Existing Fire Protection Systems Description

The existing system descriptions below are based on the best information available as of September 30, 2016. The designer shall verify on site all existing fire protection systems, equipment, infrastructure, and all conditions which affect the design of new fire protection system, and extensions and/or modifications to existing fire protection systems. The designer shall also refer to the most current existing fire protection systems information, documentation and fire pump test reports provided by Harvard Medical School, with the responsibility to verify all applicable existing systems and conditions as noted above.

1. Armenise Building

- a. Incoming Water Service or Source, and General information: The Armenise building is a 6-story building, provided throughout with Class III automatic wet pipe standpipe systems and automatic sprinkler systems. The Armenise fire protection systems are supplied by the Alpert building fire pump. A 6” express feed for Armenise extends from Alpert, across the basement. The Modell building sprinkler systems are fed from connections to the Armenise combination standpipes. Two 6” combination standpipe risers and two 4” combination standpipe risers are located at the (4) egress stairs, and they supply the wet sprinkler systems at each floor.
- b. Fire Pump: Fire protection systems are supplied from the existing fire pump located within the Alpert Building basement. The fire pump is an electric horizontal split case type and rated for 1500 GPM @ 95 PSIG boost and is designed to serve the entire sprinkler and standpipe systems of the Modell, Alpert and Armenise buildings
- c. Other Systems: A pre-action sprinkler system also exists at this building.

2. Building C

- a. Incoming Water Service or Source, and General Information: Building C is a 6-story building provided throughout with automatic wet pipe standpipe systems and automatic sprinkler systems. The Building C fire protection systems are supplied by a dedicated fire pump located at the basement, which also supplies the fire protection systems at the adjacent Gordon Hall. An 8” fire protection water service enters the Basement and is piped through an 8” double check valve assembly. The fire main then supplies the fire pump at the basement. The fire pump discharge main extends to a 6” wet alarm check valve and becomes the fire protection distribution main. The 6” distribution main extends across the ceiling of the Basement to serve the (2) 6” combination standpipes at the (2) egress stairs and the (2) 4” dedicated standpipes at the remote ends of the floor plan. The sprinkler systems are fed from the combination risers at each floor.



- b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the basement. Fire pump is rated at 1000 gpm at 50 psig boost. This fire pump also supplies the fire protection systems at Gordon Hall.
- c. Other Systems: A double interlock pre-action sprinkler system also exists at this building, at the first floor.

3. Countway Library

- a. Incoming Water Service or Source, and General information: The HMS Countway Library is an existing 6-story building currently provided throughout with an automatic fire sprinkler system and automatic standpipe system. A 6" fire protection water service enters the lower level fire pump room from the north and becomes the suction main for the fire pump. A 6" double check valve is located in the fire pump room. Two 6" combination standpipe risers are located at the (2) egress stairs, and they supply the wet sprinkler systems at each floor. A common 6" standpipe /sprinkler systems distribution main extends across the lower level to supply the standpipes.
- b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the lower level. Fire pump is rated at 750 gpm at 85 psig boost.
- c. Other Systems: An Inergen gaseous fire suppression system is located at the roof.

4. Goldenson Building

- a. Incoming Water Service or Source, and General information: The Goldenson building is a 6-story building provided throughout with Class III automatic wet pipe standpipe systems and automatic sprinkler systems. The Goldenson fire protection systems are supplied by the Alpert building fire pump. A 6" express feed for Goldenson extends from Alpert, across the basement. Standpipe risers are located within the (3) egress stairs. Two of the standpipes are 6" combination risers supplying the wet sprinkler systems at each floor. One of the standpipes is a dedicated standpipe serving fire department valves only.
- b. Fire Pump: Fire protection systems are supplied from the existing fire pump located within the Alpert Building basement. The fire pump is an electric horizontal split case type and rated for 1500 GPM @ 95 PSIG boost and is designed to serve the entire sprinkler and standpipe systems of the Modell, Goldenson, Alpert and Armenise buildings
- c. Other Systems: None.

5. Gordon Hall

- a. Incoming Water Service or Source, and General information: The fire protection systems at Gordon Hall are supplied by the fire pump at Building C. A 6" distribution



main extends across the ceiling of the Basement to serve the (3) combination standpipes at the (2) egress stairs and (1) at the west end of the floor plan. The sprinkler systems are fed from the combination risers at each floor. Two standpipe risers, the east and west risers, are 4", and the central riser is 6".

- b. Fire Pump: Fire protection systems are supplied from the fire pump located within the Building C Basement. The fire pump is an electric horizontal split case type and rated for 1000 GPM @ 50 PSIG boost
 - c. Other Systems: An FM200 total flooding gaseous fire suppression system is located at the 5TH floor IT Data Center Room:
6. Harvard Institutes of Medicine (HIM)
- a. The HIM building is 12 stories above grade including a mechanical penthouse and two basement levels below grade. Automatic sprinkler protection is provided throughout the entire existing building. A 10" Fire Service enters the Basement and is piped through an 8" double check valve assembly. The fire main then supplies the fire pump at the basement. The fire pump discharge main extends to an 8" wet alarm check valve and becomes the fire protection distribution main. The discharge main also feeds two dry valves at the fire pump room. The dry valves serve the dry sprinkler system and dry standpipe at the garage. The 8" distribution main extends across the ceiling of the Basement to serve all combination standpipes. The existing Class I combination sprinkler and standpipe system distribution feeds standpipes located in the (4) egress stairs and the existing bridge connecting to the adjacent New Research Building (NRB). Combination standpipes are located in (2) of the stairs, and the other (2) stairs are provided with dedicated standpipes. The combination standpipes dual-feed the sprinkler systems at each floor. Fire department connections are provided at the Basement to serve all systems within the building.
 - b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the basement. Fire pump is rated at 1000 GPM at 120 PSIG boost.
 - c. Other Systems: None
7. Laboratory for Human Reproduction and Reproductive Biology (LHRRB)
- a. The LHRRB is an existing 6-story building currently provided throughout with an automatic fire sprinkler system and automatic standpipe system. Automatic sprinkler protection is provided throughout the entire existing building. An existing 6" Fire Service enters the Basement and is piped through a 6" double check valve assembly. The fire main then supplies the fire pump at the basement. The fire pump discharge main extends to a 6" wet alarm check valve and becomes the fire protection distribution main. The 6" distribution main extends across the ceiling of the Basement to serve the (2) combination standpipes located in the (2) egress and (1) dedicated standpipe at the midpoint of the central corridor. The combination standpipes dual-feed the sprinkler



systems at each floor. Fire department connections are provided at the Basement to serve all systems within the building.

- b. The existing sprinkler and standpipe systems are supplied from an existing vertical fire pump located at the basement. Fire pump is rated at 500 gpm at 85 psig boost.
- c. Other Systems: An Inergen gaseous fire suppression system is located at the 6TH floor IT room.

8. New Research Building (NRB)

- a. Incoming Fire Service or Source, and General information: The NRB is an existing 11-story high-rise building, which is provided throughout with an automatic fire sprinkler system and automatic standpipe system. The existing sprinkler and standpipe systems are supplied from an existing electric driven fire pump at the Ground Floor of the NRB. An 8" private fire protection water main enters the Basement off the municipal main in Blackfan Circle, is piped through an 8" double check valve assembly, and serves as the suction supply for this fire pump. The fire pump discharge main extends to an 8" wet alarm check valve, and two 4" dry valves at the fire pump room. The dry valves serve the dry sprinkler systems at the two below grade parking levels. The fire pump discharge extends across the ceiling of the Ground Floor to serve all combination standpipes. The Class I combination sprinkler standpipe system feeds standpipes located in the (3) egress stairs and the existing bridge connecting to the adjacent Harvard Institute of Medicine (HIM) building. The 2½" fire department hose valves are provided at the floor level landings of egress stairs. Test/drain risers are provided in the stairs adjacent to the combination sprinkler/standpipe risers. Automatic sprinkler protection is provided throughout the entire building. Floor control valve assemblies are located at the floor level of the Northeast and Southwest egress stairs and dual-feed the sprinkler systems at each floor. Fire department connections are provided at the First Floor level to serve all systems within the building.
- b. Fire Pump: The existing NRB fire pump is a horizontal split case, electric driven fire pump, with a rated capacity of 1000 GPM at 180 PSIG boost.
- c. Other Systems: Two Ansul dry chemical suppression systems are located at the kitchen.

9. Seeley G. Mudd

- a. Incoming Fire Service or Source, and General information: The HMS Seeley Mudd is an existing 6-story building currently provided throughout with an automatic fire sprinkler system and automatic standpipe system. There is a fire pump at the basement. There are two 6" fire protection water service mains serving this building, extending from the municipal water system. One of the 6" mains feeds a dedicated alarm valve for the basement sprinkler system, not supplied from the fire pump. The other 6" main is the suction for the fire pump, which serves the standpipe system and all sprinkler systems above the basement. A 6" fire protection distribution main extends across the



basement to serve the standpipes, one of which is a combined standpipe. Sprinkler systems at each floor above the basement are fed from the combination standpipe.

- b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the basement. Fire pump is rated at 500 gpm at 90 psig boost.
- c. Other Systems: None

10. Tosteson Medical Education Center (TMEC)

- a. Incoming Fire Service or Source, and General information: The HMS Tosteson Medical Education Center (TMEC) Building is an existing 5-story building currently provided throughout with an automatic fire sprinkler system and automatic standpipe system. The combination standpipe system is supplied from an 8" fire protection main connected to an existing fire pump, located at the basement level. The fire pump is supplied from an 8" fire protection water service connected to the municipal water system. The existing standpipe system includes 2-1/2" fire department hose valves in the stairwells.
- b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the basement. The fire pump is rated at 1500 GPM at 60 PSIG boost, and is an electric-driven horizontal split case unit.
- c. Other Systems: An Inergen gaseous fire suppression system is located at the basement.

11. Vanderbilt Hall

- a. Incoming Fire Service or Source, and General information: Vanderbilt Hall is an existing 7-story building currently provided throughout with an automatic fire sprinkler system and automatic standpipe system. Most of the building sections are 4 and 5 story, but a small portion of the north wing includes a 6th floor and penthouse. The building is arranged as rectangular loop with a center exterior courtyard/tennis court. The combination standpipe system is supplied from an 8" fire protection main connected to an existing fire pump, located at the basement level. The fire pump is supplied from an 8" fire protection water service connected to the municipal water system. The 8" fire protection main distribution extends down to the sub-basement, forming a perimeter loop distribution main, to supply all standpipe risers, most of which are 4" standpipes, with the exception of one 6" standpipe at the northwest area. Original system design intent appears to be designing to a remote standpipe demand pressure of 65 PSIG.
- b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the basement. The fire pump is rated at 1000 GPM at 75 PSIG boost, and is an electric-driven horizontal split case unit.
- c. Other Systems: None.



12. Warren Alpert Building

- a. Incoming Fire Service or Source, and General Information: The Warren Alpert Building is an existing 5-story high-rise building, which is currently provided throughout with an automatic fire sprinkler system and automatic standpipe system. The existing sprinkler and standpipe systems are supplied from an existing electric driven fire pump at the basement of the Alpert Building. An 8" private fire protection water main, connected to a municipal water main in Longwood Ave., serves as the suction supply for this fire pump. Downstream of the existing fire pump, main piping distribution extends to alarm valves for various buildings and areas. Goldenson, Modell and Armenise Buildings' fire protection systems are supplied by the Alpert fire pump. The 6" main distribution for the Alpert Building extends further downstream of a dedicated 6" alarm valve to feed two 6" standpipes at the 2 egress stairs. These standpipes extend up through the building serving sprinkler systems zoned independently by floor. Typically, these standpipes feed automatic wet sprinkler systems, which are dual-fed with a floor control valve assembly at each standpipe in the stairwell floor landings.
- b. Fire Pump: The existing Alpert Building fire pump is a horizontal split case, electric driven fire pump, with a rated capacity of 1500 GPM at 95 PSIG boost. . It is located at the basement.
- c. Other Systems
 - i. This building also includes six (6) dry sprinkler systems serving the garage and loading dock. A pre-action sprinkler system is located at the penthouse.
 - ii. Due to the proximity of the Modell addition to the adjacent Alpert Building, and potential fire exposure from the addition to the Alpert, an exposure protection deluge sprinkler system is provided at the west exterior wall of the Alpert Building. The deluge sprinklers are located at the tops of Alpert windows at Levels 2, and 3. A Protectowire linear heat detection system mounted to the exterior piping initiates the deluge valve release upon detection of temperature rise above 280F. The deluge system control/alarm/release panel is a Protectowire type and reports back to the building fire alarm system.

13. 158 Longwood Avenue

- a. The 158 Longwood Avenue building is currently not provided with any fire protection systems.

14. 160-164 Longwood Avenue

- a. Incoming Water Service or Source, and General information: The 160-164 Longwood building is a 4-story building provided with an automatic wet sprinkler system at the basement only. The remainder of this building is not currently provided with any fire



protection systems. The 160-164 Longwood sprinkler system is supplied by the 641 Huntington building fire pump.

- b. Fire Pump: Fire protection systems are supplied from the existing fire pump located within the 641 Huntington Building basement. The fire pump is an electric horizontal split case type and rated for 450 GPM @ 50 PSIG boost.
- c. Other Systems: None

15. 180 Longwood Avenue

- a. Incoming Water Service or Source, and General information: The 180 Longwood building is a 3-story building provided with an automatic wet sprinkler system at the basement, and a partial sprinkler system at the 1ST floor only. The remainder of this building is not currently provided with any fire protection systems. The 180 Longwood sprinkler system is supplied by a direct connection to the municipal water main in Longwood Ave.
- b. Fire Pump: None; this building is supplied by municipal water system pressure only.
- c. Other Systems: A total flooding Novec 1230 gaseous fire suppression system is located at the Basement to protect the IT Room 031.

16. 641 Huntington Avenue

- a. Incoming Fire Service or Source, and General information: The 641 Huntington Ave building is a 4 story building with a penthouse, currently provided throughout with an automatic fire sprinkler system and manual standpipe system. The sprinkler and standpipe systems are supplied from a 6" fire protection main connected to an existing fire pump, located at the basement level. The fire pump is supplied from city water service. A 6" combination sprinkler and standpipe distribution main extends from the fire pump room to serve the 4" standpipe riser at the egress stair. A second express 2-1/2" fire protection distribution main extends from the fire pump to the sprinkler system at 160-164 Longwood Ave. There does not appear to be a fire dept. inlet connection.
- b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the basement. Fire pump is rated at 450 GPM at 50 PSIG boost.

17. School of Dental Medicine

- a. The School of Dental Medicine building is currently not provided with any fire protection systems.

18. Research and Education Building (REB)



- a. Incoming Fire Service or Source, and General information: The REB is an existing high rise 6-story building, 5 occupied floors, plus a mechanical penthouse, currently provided throughout with an automatic fire sprinkler system and automatic standpipe system. There is a fire pump at the basement. There is an 8" fire protection water service main serving this building, extending from the municipal water system. The 8" main is the suction for the fire pump, which serves the standpipe system, and all wet, dry, and deluge sprinkler systems. A 6" fire protection distribution main extends from the fire pump discharge, across the basement, to serve the standpipes, both of which are combined standpipes. Wet sprinkler systems at each floor are fed from both combination standpipes. A dry sprinkler system is located at the basement loading dock, receiving and associated areas subject to freezing. The dry valve is located at the Basement West Mech room. A dry sprinkler system is located at the penthouse emergency electric, generator and associated areas subject to freezing. This dry valve is located at the Penthouse Southwest Mech area.
- b. Fire Pump: The existing sprinkler and standpipe systems are supplied from an existing fire pump located at the basement. Fire pump is rated at 1000 gpm at 130 psig boost. A master pressure reducing valve is provided immediately downstream of the fire pump discharge to limit system pressures to 165 PSIG or less.
- c. Other Systems: None
 - i. Due to the proximity of the REB to the adjacent Harvard School of Public Health Building, a deluge exposure protection system is located at the exterior of the Penthouse and 5TH floor.

19. Jeffrey Modell Building

- a. Incoming Water Service or Source, and General information: The Jeffrey Modell Immunology Center is a 2- story addition to the existing 6-story Armenise Building. Existing Class III automatic wet pipe standpipe systems are provided in both the Alpert and Armenise buildings, and also serve the Modell building. The Modell building is provided throughout with wet automatic sprinkler systems connected to the combination standpipes at the Armenise building.
- b. Fire Pump: Fire protection systems are supplied from the existing fire pump located within the Alpert Building basement. The fire pump is an electric horizontal split case type and rated for 1500 GPM @ 95 PSIG boost and is designed to serve the entire sprinkler and standpipe systems of the Modell, Goldenson, Alpert and Armenise buildings.
- c. Other Systems: Refer to Warren Alpert Building description of the exposure protection sprinkler system.