EASTERN FIRE PROTECTION

FIRE PROTECTION CONTRACTORS AND ENGINEERS
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465 Congress Street, Portland Maine

Summary of Life Safety Features,

Deficiencies, & Plan of Correction

Building Description

- Year Built - early 1900s.
- Number of Stories – 11, plus one story below the level of exit discharge which houses mechanical and electrical equipment and is not currently occupied or used for other purposes.
- Applicable Codes – NFPA 101 Life Safety Code & NFPA 1 Fire Code
- Construction - Type II (000)
- Occupancy Classification – Existing Business, High Rise
- Area per Floor – 6,400 square feet
- Occupant load per floor based on 100 Sq. Ft \ person = 64

Existing Egress Capacity and Arrangement

The building footprint is relatively small which results in exit access travel distances below the maximum allowed for the occupancy. Two means of egress are required and are provided as follows:

1) The main exit stair tower is separated from the individual floors by a 2 hour enclosure that runs from the top floor down to the second floor area. At the second floor, the exit transitions to horizontal travel for a short distance to another stair that connects to the story below which is referred to as the "Mezzanine level". This partial level is actually an atrium story since it is not open to the first floor, and is separated from the first floor tenant by both sheetrock and glazed partitions. As part of the "Plan of Correction", listed window sprinklers shall be installed at the glazed partitions to achieve the required one hour separation between the horizontal exit and the adjacent tenant. Stair risers, treads, and railings meet NFPA 101 requirements for existing buildings. The effective clear width for vertical travel is 44", which equates to a maximum capacity of 146 occupants entering the stair per floor. This value far exceeds the anticipated maximum load of 64 occupants per floor.

2) The secondary means of escape stair consists of a masonry brick tower with metal stairs. This stair travels from the roof level down to the second level where it connects to an outside (enclosed) stair that goes to exit discharge at grade. Stair risers, treads, and railings meet NFPA 101 requirements for existing buildings. The stair was originally designed and constructed to have a clear width for vertical travel of 31.5". Mechanical and electrical utilities installed through the stair winders reduce the clear width for vertical travel to 22".

Deficiencies and Plan of Correction

1) NFPA 101, 39.4.2 requires existing business high rise buildings to be provided with a reasonable degree of safety from fire. The code provides two options towards meeting this goal. The owner has chosen option #1, which is to install a complete **automatic fire sprinkler system** in accordance with 9.7.1.1(1) of the code. The building is currently equipped with a partial system which protects the 2nd, 7th, and 8th floors.

   The third floor fire sprinkler system will be installed and complete by July 31st, 2013. Fire sprinklers for the remaining levels are to be completed no later than July 31st 2016.

2) NFPA 1, 13.2.2.3 requires all high rise buildings (new and existing) to be provided with a **Class I Standpipe system**. The building isn't currently equipped with any standpipes. NFPA 14, which governs standpipe system design and installation, requires a standpipe in all required exit stairwells. Two standpipes are therefore required and will be installed in the main stair, as well as the secondary means of escape stair.

   The existing fire sprinkler riser in the main stair will be converted to a combined riser feeding sprinklers and 2.5" fire department hose valves. The existing riser needs to be extended to the top floor, and also into the mezzanine and first floor levels where the stairwell changes. The main stair standpipe work is to be completed no later than 12/31/13.

   The standpipe for the secondary exit stair will extend from the second floor level up to the roof level. This work is to be complete no later than July 31st, 2016

3) The existing partial fire sprinkler system is supplied by the municipal water supply. This supply is not adequate to meet the fire sprinkler demands for the upper floors. Additionally, the existing supply cannot meet the NFPA 14 pressure demands for the fire standpipes without being boosted. Following is the proposed scope of work relating to the necessary **water supply improvements:**

   Fire Pump – Mechanical Work

   - 50 HP, 750 GPM, 80 PSI electric fire pump, jockey pump, and all required equipment, piping and fittings & fire alarm interface modules.
   - Full size (6") pump bypass main and valves
   - New 6" feed main from the existing water entrance to the new pump room.
   - Relocation of the existing 4" system riser to the new pump room.

Fire Pump – Electrical Work

- Conductor installation in an existing empty conduit from the outside transformer secondary to the existing basement electrical distribution room.
- Installation of conductors through the basement electrical room to the adjacent new pump room.
- Encasement of conductors in concrete to provide the required two hour fire rating.
- Fire pump alarm, trouble, and supervisory interface with the building fire alarm system.
- Lighting and service outlets for the pump room
- Electrical engineer's review and stamp.

Note #1: It is our interpretation that emergency backup power is not required for Existing Business High Rise occupancies where the primary power is deemed to be reliable. Our discussions with CMP indicate the power is reliable as defined by the applicable standard (NFPA 20).

Note # 2: The fire pump and equipment need to be located in a separated, dedicated, 2 hour rated room. The walls of the intended pump room qualify as 2 hour rated. Openings to the room will be protected with a new rated door and masonry infill.

All fire pump work - Mechanical and electrical, is to be complete no later than 12/31/13.

Please don't hesitate to contact me with any questions or comments,

Sincerely,

Marc L. Tardif, PE
Fire Protection Engineer