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Date: 22 September, 2014

Memo Report

From: W. Mark Cummings, P.E.

To: Mr. Gabe Zappia

Subject: Fire and Life Safety Evaluation of 1844 Forest Ave., Portland, ME

As requested, Fire Risk Management, Inc. (FRM) has performed a review of the building located at 1844 Forest Avenue in Portland, ME. A particular emphasis for this review is the planned, future addition of a residential unit within the existing attic space of the building. The building is currently being used to support functions that would generally be classified as "assembly" in nature.

Background

The existing building at 1844 Forest Avenue is currently being renovated to update the assembly areas located on the lower (basement) and main (1st) floors. The existing building would generally be classified as an Assembly (A-3) occupancy, per the definitions of the International Building Code (IBC). The apartment unit that is planned for a future renovation would be classified as a Residential (R-2) occupancy.

The existing building appears to generally consist of Type VB or Type V (000) construction; as defined by the IBC and the National Fire Protection Association (NFPA) respectively. Included with the ongoing renovations is the installation of an automatic fire sprinkler system throughout all levels; including the existing attic space that is to be potentially converted to an apartment unit. Additionally, a fire alarm/notification system is to be installed in the assembly areas; basement and 1st floor levels. The basement level is only partially below grade, with the 1st floor level being approximately 5 or 6 feet above grade. Based on the guidelines outlined in the NFPA's Life Safety Code® (NFPA 101), with the addition of residential unit in what is now an unfinished attic space, this building would be considered a 2-story structure.

Based on a site review of the building performed on 10 September, 2014, the primary structural components appear to consist of heavy timber (HT) construction. This includes the floor/ceiling assembly between the basement and 1st floor levels. Although the framing of the floor/ceiling assembly between the 1st floor and attic space is also heavy timber, the ceiling of the 1st floor consists of architectural "tin" ceiling material that is attached directly to the ceiling/floor joists.

Discussion

In addition to the drawings provided that generally detailed the proposed floor plans for the basement and 1st floor levels, dated 05/27/11, the primary documents used to support this review were the 2009 edition of NFPA 101 and the Maine Uniform Building and Energy Code (MUBEC), which consists of the 2009 edition of the IBC with amendments. Although this is an existing building, the proposed 2nd floor level that is to be a residential area (occupancy), it is

new construction and must therefore comply with all aspects of Chapter 30, *New Apartment Buildings*, of NFPA 101, along with the IBC requirements.

Based on the code requirements outlined in the IBC, it would be necessary to provide a 1-hour fire separation between the assembly and residential portions of the building. Although heavy timber construction is generally considered as having an inherent 1-hour fire resistance, the existing floor/ceiling assembly separating the 1st and 2nd levels would not likely meet that definition due to the lack of a "timber" flooring material, that typically consists of wood planking; usually ¾ to 1 inch in thickness.

The existing attic space is accessed via a single stairway that originates in the large assembly area on the 1st floor. It appears that the wall separating the stairway from the assembly space, including the use of a fire-rated door assembly, has been designed to provide a 1-hour fire separation.

Based on the requirements within section 30.2.4.2 of NFPA 101, it is possible for this space to comply with NFPA 101 using only a single means of egress as long as the stairway serves only that unit and is separated from the remainder of the building by barriers having a 1-hour fire resistance rating. This requirement also includes a need for this stairway to lead directly to the building's exterior. As such, the configuration of the existing stairway leading to 2nd floor level would need to be modified or a second means of egress would need to be provided, such as an exterior stairway as a second means of egress.

Summary and Recommendations

In general, the potential for inclusion of an apartment unit on the 2nd floor of the building at 1844 Forest Avenue does appear to be feasible, but specific building modifications will be required to ensure this renovation is compliant with the applicable codes. The following recommendations are provided:

1. The residential unit should be separated from the assembly area below using a floor/ceiling assembly that provides up to a 1-hour of fire resistance. Although heavy timber construction will inherently meet that requirement, there is no existing timber flooring at the 2nd floor level. To achieve the necessary 1-hour fire resistance, it is recommended that the space between the floor joists be completely filled with a non-combustible insulation material, filling all void spaces within the floor assembly. Equally, a wood subfloor should be installed that has a minimum ¾ inch thickness.
2. If a single means of egress is to be used for access to the proposed apartment unit, the existing stairway will need to be modified such that it provides direct access to the building's exterior, with no openings connecting this stairway to the rest of the building and all barriers separating it from the other areas of the building must have at least a 1-hour fire resistance rating.
3. The apartment unit should be provided with fire alarm/notification devices that are connected to the building-wide system. The fire alarm system for the entire building, assembly and residential areas, should be a single system, including the use of manual pull stations at all exits; both for the assembly and residential areas. This will ensure that the occupants of the residential unit have more than sufficient notification to allow for adequate egress in the event of a fire emergency below.

If you have any questions regarding what has been outlined above, please don't hesitate to contact me.

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Principal Engineer