



## **FIRE RISK MANAGEMENT, INC.**

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# **Memo Report**

**From:** W. Mark Cummings, P.E.  
**To:** Mr. Bill Hopkins; Archetype Architects  
**Subject:** **Fire Protection & Life Safety Review of the Proposed Maine Wharf Museum**

As requested, Fire Risk Management, Inc. (FRM) reviewed the information you provided with regards to the current plans for the renovation of the 2<sup>nd</sup> and 3<sup>rd</sup> floors of the (existing) Maine Wharf building located 68 Commercial St. in Portland, ME. The purpose of the renovations is to accommodate the use of these floors as a museum. The focus for this review is to provide a preliminary evaluation of the fire protection and life safety features on the 2<sup>nd</sup> and 3<sup>rd</sup> floors.

Although it is indicated that some miscellaneous office spaces are to be included with the 2<sup>nd</sup> floor renovation, these are associated with the new museum and, therefore, the overall classification that will be assigned to this new use will be that of an Assembly, Group A-3 occupancy; as defined by the International Building Code (IBC).

The codes and regulations used as reference for this review included;

1. The Maine Uniform Building and Energy Code "MUBEC" (2009 IBC with amendments).
2. The Life Safety Code®, NFPA 101; 2009 ed.
3. The City of Portland Code of Ordinances; primarily Chapter 10, *Fire Prevention and Protection*, (Rev. 1-20-11),
4. City of Portland Technical Manual, Section 3 – Public Safety, (Rev. 6/17/11), and
5. City of Portland Fire Department Rules and Regulations.

## **DISCUSSION**

This initial review focused primarily on the proposed renovations for the 2<sup>nd</sup> and 3<sup>rd</sup> floor levels and their potential use as a museum; and specifically evaluating the available means of egress from these upper floors. The primary codes being referenced are NFPA 101 and the IBC/MUBEC. This review was based on the drawings provided by Archetype Architects; dated 05/13/2015.

### ***Building Information***

The current building construction would be classified as Type IIB, per the IBC, and Type II (000), per NFPA 101. It is understood that as part of the renovation activities, the building's structural components are to be protected using materials that will provide at least a 1-hour fire resistance rating. This will allow the building, which is a 3-story structure, to meet all building height restrictions associated with Assembly occupancies.

### ***Fire Protection Systems***

It is reported that the building will be fully protected by automatic fire sprinkler systems throughout, which will need to be compliant with NFPA 13 and be properly supervised (MUBEC 903.2.4 & 903.3.1.1). Additionally, it is reported that a fire detection / alarm / notification system is to be installed, which will need to be compliant with the requirements of NFPA 72.

### ***Means of Egress***

The building is provided with two stair enclosures; one of which leads directly to the building's exterior. Unfortunately, due to the location of the stair enclosures, coupled with the assembly use of the 2<sup>nd</sup> and 3<sup>rd</sup> floors, the upper floors will not meet code requirements pertaining to "common path of travel."

Specifically, the common path of travel distance from the southeast end of each floor will exceed that which is allowed by NFPA 101. Although a new stair is to be included near the southeast corner of the building, this stair only connects the 2<sup>nd</sup> and 3<sup>rd</sup> floor levels and is currently designed as being “open;” effectively meeting the NFPA definition of a “convenience opening” (stair), per section 8.6.8 of NFPA 101. Such openings/stairs are not permitted to be used as part of any required means of egress.

In addition to meeting the Tenant’s requirements regarding the “flow” of people through the museum’s exhibits, it is understood that there is a desire to keep this stairway open to also allow for additional natural lighting within the museum space. However, if this stairway is to be considered as an option to alleviate the lack of compliance for common path of travel, it will need to be isolated from the rest of the building by barriers having a fire resistance rating of at least one hour, or be protected in a manner that has been deemed as providing equivalent protection through the implementation of a performance-based approach and that has been accepted by the Authority(ies) Having Jurisdiction (AHJs); which likely includes the State of Maine’s Fire Marshals Office and the City of Portland’s Fire Prevention Bureau.

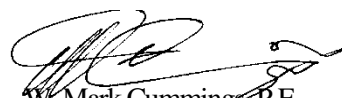
If this stair can be used as part of the required means of egress, it would allow occupants within the southeast end of the building that may be isolated from accessing the center stair enclosure (Stair B) by a fire on their particular floor to then move to the alternate floor level to gain access to the stair enclosure. Even when using this more “circuitous” route, the total travel distance to an exit is still within the 250-foot maximum allowed by NFPA 101.

A possible option that could be explored for protecting the stairway in the southeast portion of the building, while continuing to meet the Tenant’s requirements/expectations, would be to enclose the stair using walls and doors that incorporate glass panels. The glass could then be protected by modifying the existing sprinkler system, at each level, to include additional sprinklers located around the periphery of the stair enclosure, designed such that all portions of any exposed glass would be subject to direct water application. This is a method that is routinely used to protect glass walls/panels that form barriers of atriums. If it is also desired that the doors that provide access to this stairway remain open at all times other than in an emergency, magnetic hold-open devices could be installed that are operated by the fire detection/alarm system; via actuation of adjacent smoke detectors as outlined in NFPA 72.

## **RECOMMENDATIONS**

Based on the initial review of the plans provided for the proposed renovations to the 2<sup>nd</sup> and 3<sup>rd</sup> floors of the Maine Wharf building, it will be necessary to take steps to alleviate the excessive length of the common path of travel distance from the southeast end of the building. Without making major structural changes to the building itself, beyond that which is already planned, the most viable option to correct this code deficiency appears to be providing separation for the stairway connecting the 2<sup>nd</sup> and 3<sup>rd</sup> floor levels in this area of the building. Based on discussions regarding the Tenant’s requirements for the museum, it is recommended that consideration be given to separating this stairway from the remainder of the building, using an alternative approach that is designed to provide an equivalent level of protection to that which would be afforded if “standard” fire rated assemblies were used. It is believed this can be achieved through the use of glass, or partial glass, walls and doors that are specifically protected using the installed fire sprinkler system. Equally, automatic closing doors controlled by the fire alarm system could also be used to allow the uninterrupted flow along these stairs during normal operations. However, any such approach will need to be approved by the AHJ(s); and such approval should be obtained prior to moving forward with any efforts along these lines to ensure they are, in fact, willing to consider a performance-based alternative.

Should there be any questions regarding this evaluation and the recommendations contained herein, please do not hesitate to contact me.

  
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