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CITY OF PORTLAND, MAINE RESURGAM
Reviewed for Code Compliance
Inspections Division
Approved with Conditions
Date: 11/22/16

Date: 6 September, 2016

Memo Report

From: W. Mark Cummings, P.E.

To: Ms. Katherine Detmer; Archetype Architects
Mr. Bill Hopkins; Archetype Architects

Subject: **Updated Fire Protection & Life Safety Code Review of the Brick South Building at Thompson's Point**

As requested, Fire Risk Management, Inc. (FRM) has reviewed the updated information you provided with regards to the current plans regarding the proposed renovations and use of the (existing) Brick South building located at Thompson's Point in Portland, ME. The focus for this review is to evaluate the fire protection and life safety features of the building to ensure that all applicable codes, regulations, and ordinances are continuing to be adequately addressed. As you are aware, FRM has previously performed code reviews for this building in connection with prior, temporary, uses of this structure. Those reviews primarily focused on both access and egress to/from the building, along with the siting of the building within the development to ensure that adequate fire protection features, such as water supply, fire department vehicle access, etc., are provided. The primary codes and regulations used as reference for this recent building plan review include, but are not limited to;

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. The Fire Code®, NFPA 1; 2006 ed.

DISCUSSION

This review of the Brick South building focuses solely on the building itself and was conducted primarily using the Life Safety Code® and the MUBEC. The review is based on the Floor Plan and Elevation drawings provided by Archetype Architects on 08/31/16. It is understood that at this point in time, the building is to undergo renovations to modify its use as, primarily, an "assembly" occupancy; with the ability to accommodate a wide range of functions and events. Therefore, this building is to be classified as an "Assembly (A-3)" occupancy, per the definition outlined in the International Building Code (IBC). Equally, although the drawings provided indicate the potential to separate the main (west) portion of the building from the east annex section by a fire wall, it is understood this option is no longer to be pursued and the building is to be treated as a single structure / occupancy; with the areas within the annex portion being accessory to the main use.

Building Information

Building Classification: Assembly (A-3), Ordinary hazard per NFPA 101 § 6.1.2.1 & 6.2.2.3 and the MUBEC.

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Construction type: The main (west) section of the building consists of masonry exterior walls with combination of non-combustible and combustible (heavy timber) structural components; all unprotected and meeting the IBC definition for a Type IIIB [or NFPA 101 Type III (200)] construction. The east annex of the building also consists of masonry exterior walls, but the supporting structure is entirely unprotected steel; meeting the IBC definition of a Type IIB [NFPA 101 Type II (000) construction. Since the annex portion of the building is now to be used as part of the Assembly occupancy, and to allow for an adequate level of occupancy loading that will accommodate its intended use, the entire building is to be designed to meet the requirements for a Type IIIA [Type III (211)] construction. This is to be accomplished by providing additional fire protection for the structural components where required to achieve this rating.

For a single-story structure of this construction type that is to be protected throughout by automatic fire sprinkler systems, the maximum permitted height is 3 stories, 75 ft; with a maximum permitted area of 38,000 SF, per IBC Table 503, Sections 504.2 & 506.3. An additional 40% increase in the allowable area can be included due to the building having road frontage on three sides; for a total allowable area of 53,200 SF.

Height and Area: The main (west) structure of the Brick South building has a maximum height of approximately 39 ft (1 Story), in height, with approximately 25,400 SF of (gross) area. The east annex portion of the building consists of approximately 7,350 SF of (gross) area. Three (3) small areas/additions are also attached to the west and south walls; consisting of additional small storage and kitchen areas/ These areas add approximately 2,000 SF to the overall building area; making the combined area for the entire structure approximately 34,750 SF. The total height and area of the building is well below the maximum allowed by the codes.

Interior Finish: Due to the installation of fire sprinkler systems, the interior wall and ceiling finishes are permitted to be either Class A, B, or C for all areas per NFPA 101; whereby the sprinkler system allows for a reduction in one Class level based on the original requirements within Chapter 12.

No specific requirements exist for the flooring materials. The current building design does not include any exit enclosures, which would be the only portion of this building that might require the use of fire-resistant materials on the floor; due to the presence of the fire sprinkler system.

Extinguishment: Unless the installed fire sprinkler system(s) utilize quick-response type sprinklers, portable fire extinguishers will be required to be installed in this building in accordance with NFPA 10, per IBC/MUBEC 906.1.

Means of Egress

Occupant Load: Based on the stated intended use for the building, the estimated maximum occupant load for the building would be approximately 3760 people; with the vast majority of this occupant load, approximately 3625 being within the large assembly area. However, it is reported that the building owner has stated that the maximum occupant load for the building is to be restricted to 2500 persons.

The original occupant load value is based on NFPA's occupant load factor for Assembly areas; for "concentrated use"; whereby 7 SF (net) per occupant is provided within the main assembly space, per NFPA 101, Table 7.3.1.2 and MUBEC Table 1004.1. The occupant load factors for storage, business, kitchen, and "less concentrated" use assembly areas were also applied to the various areas contained within the east section of the building and those along the west and south walls. However, since the occupant load for the building is to be restricted

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by the owner, the value of 2500 persons will be used for determining the requi exits; number and capacity.

Number of Exits: Based on the stated maximum occupant load, the building will be required to have at least four (4) separate exits. However, due to the potential occupancy load for the main assembly area, this area alone is also required to have at least four (4) separate means of egress.

The four (4) means of egress required for the main Assembly area of the building is required per NFPA 101 § 7.4.1.2. A single means of egress is acceptable from most other areas/rooms of the building; albeit multiple means of egress / exits are located throughout the eastern (annex) section of the building as well. The means of egress from all areas of the building must also be properly spaced throughout the building's exterior walls to ensure they are adequately remote from one another and to ensure compliance with travel distance requirements outlined below. Based on a review of the proposed building plan, all exits from all areas of the building appear to be adequately separated from one another to easily meet code requirements.

Egress Capacity: Based on the estimated occupant load for the building, a total (clear) exit width of at least 500 inches (approx. 42 ft) must be provided by the available means of egress (exits). Since the planned occupant load for just the main assembly space has not been specifically defined, it will be assumed that this space alone must provide sufficient egress for up to 2500 persons. Assembly occupancies also have specific requirements to provide a "main entrance." This main entrance is required to have a capacity that can accommodate at least ½ of the total occupant load, per NFPA 101 § 12.2.3.6.2 (2). As such, the main entrance to the main Assembly area will be required to provide at least 250 inches (approx. 21 ft) of clear exit width. The remaining 250 inches of clear exit width are to be distributed amongst the other three (or more) required exits serving the main assembly area. All other exits provided should be provided with a minimum clear exit width of at least 34 inches. Based on a review of the proposed design plan for the building, more than sufficient exits, and exit width, are provided for all areas of the building.

Distance Limitations: *Dead end corridor*: The maximum allowable length for any dead end corridor is 20 ft, per NFPA 101 § 12.2.5.1.3 and MUBEC 1018.4 for assembly occupancies. The current building design includes no dead-end corridors.

Common path of travel: The maximum allowable common path of travel for assembly occupancies is 20 ft, or up to 75 ft where serving less than 50 people; per NFPA 101 § 12.2.5.1.2. The only areas where common path of travel to a means of egress exists is in the small storage areas and restrooms. However, no common path of travel within the building will exceed the code limits.

Exit access travel distance: In buildings protected with fire sprinkler systems, travel distance up to 250 ft is allowed for Assembly occupancies, per NFPA 101 § 12.2.6.2. Based on the proposed design plan for the building, the maximum travel distance to an exit from any location within the building is well below the code limit.

Egress Marking: Illumination should be provided in accordance with NFPA 101 § 7.8 and IBC / MUBEC 1101.2.

Emergency lighting should be provided in accordance with NFPA 101 § 7.9 and IBC / MUBEC 1006.

Egress signs shall be provided in accordance with NFPA 101 § 7.10 and IBC / MUBEC 1011.1.

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Fire Protection Systems

Fire Sprinkler System: Based on the building's use as an Assembly occupancy, an automatic fire sprinkler system(s) will be required to be installed throughout the building.

The building is to be provided with a new automatic fire sprinkler system(s), which will be designed/installed to be compliant with NFPA 13 and will be properly supervised per IBC / MUBEC 903.2.4 & 903.3.1.1.

The installed fire sprinkler system within the main assembly area is also to be used to provide the necessary fire protection for the building's steel structural components. Similar to an approach often used in protecting the structural components of warehouses, the sprinkler system will be designed to "wet" the structural components that are required to have at least a 1-hour fire resistance rating (FRR) to prevent their internal temperatures rising to the point that any reduction in the steel's yield strength occurs. The plans for the proposed fire sprinkler system design are to be reviewed and approved by the local AHJ, Portland's Fire Prevention Bureau, to ensure the design will provide adequate protection for the building's structural components.

Fire Alarm and Notification System: A fire alarm/notification system will be required to be installed in this building, since there will be more than 300 occupants per NFPA 101 § 12.3.4.1.1. The fire alarm/notification system will also be required to monitor the automatic fire sprinkler system.

SUMMARY & RECOMMENDATIONS

Based on a review of the drawings provided, the proposed building design plan is generally compliant with all applicable code requirements; albeit a number of design requirements will need to be verified and/or implemented to ensure this building is fully compliant with all facets of the applicable codes and regulations. Specifically, this includes verification and approval of the fire sprinkler system design that will be supporting the requisite fire-resistance rating of the steel structural components within the main assembly area; which will need to have at least a 1-hour FRR. Equally, fire sprinkler and alarm/notification systems will need to be installed throughout the building in accordance with NFPA 13 and 72, respectively.

It will also be necessary to implement the administrative and operational procedures and policies necessary to ensure that the maximum occupant load within the main assembly area, which includes both public and Staff, is not exceeded.

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

W. Mark Cummings, P.E.
Principal Engineer