

January 31, 2019

Office of State Fire Marshal
State of Maine
52 State House Station
Augusta, ME 04333-0052

**RE: Maine Medical Center - East Tower Expansion Project
Through Floor Firestopping T Rating Compliance Alternative**

To whom it may concern:

Code Red Consultants has been retained by Maine Medical Center (MMC) to serve as the firestopping special inspector on the East Tower Expansion project on its Bramhall Campus in Portland, Maine. During the pre-installation planning process, a conflict between the 2015 Maine Building Code and the 2012 Edition of NFPA 101, the Life Safety Code relative to temperature rise ("T" Rating) requirements for through floor penetrations was identified. The Life Safety Code contains an exception to omit the T Rating under certain conditions that is not present in the Building Code. Code Red Consultants assisted MMC in obtaining approval of a compliance alternative with the City of Portland Permitting and Inspections Department based on the exception in the Life Safety Code. While the project is in compliance with the Life Safety Code Requirements, we wanted to notify you of the approach to meeting this requirement and to provide coordination between all Authorities Having Jurisdiction.

Facility Description and Background Information

This project consists of a two-story addition to the existing East Tower Building on campus. The project will also include the construction of a new penthouse and helipad. The use of the space will be primarily Health Care. Each floor is approximately 29,000 SF in area. The extension of the building will also classify the structure as a high-rise building. The East Tower Building is of Type I Construction and is fully sprinkler protected.

As part of the project, new through floor penetrations were created through the existing 2-hour floor slabs as well as the newly created 2-hour floors. These through penetrations have varied conditions consisting of ducts, pipes, electrical conduits and cables, and other penetrating items to serve building systems. A majority of these through floor penetrations occur within wall cavities, chases, and other locations where the penetrating items are not open to rooms or other occupied spaces. There are a number of typical rooms and spaces that have through floor penetrations which are not enclosed in the building construction such as electrical rooms, IT rooms, and mechanical rooms. The following section of this report details the methodology used to prevent fire spread through rated horizontal fire barriers.

Code Requirements

The approach utilized is based on the requirements of NFPA 101, *Life Safety Code*, 2012 Edition, which is being utilized for this project based on an approved waiver request. The firestopping requirements of NFPA 101 Section 8.3.5 were utilized throughout the facility. An exception is

provided in Section 8.3.5.1.4 that allows the omission of the T rating where there is no hazard of an adjacent combustibles coming into contact with the penetrating item.

8.3.5.1.4 Penetrations in fire-rated horizontal assemblies shall have a minimum 1-hour T rating, but not less than the fire resistance rating of the horizontal assembly. Rated penetrations shall not be required for the following:

- (1) Floor penetrations contained within the cavity of a wall assembly
- (2) Penetrations through floors or floor assemblies where the penetration is not in direct contact with combustible material

The Maine State Building Code does not contain this exception and would require T Ratings for through floor penetrations when they are not located within a wall cavity. This conflict between the two codes is what prompted the compliance alternative to utilize a common approach that was acceptable to all authorities having jurisdiction.

Methodology of Compliance

The challenge in applying this exception is assurance that combustible materials will not be stored next to a through floor penetration. To properly utilize the exemption in NFPA 101-8.3.5.1.4(2), Maine Medical Center is proposing the following measures:

1. Permanent signage adjacent to the through-floor penetrations indicating that there shall be no storage in the area.
2. Permanent flooring or painted markings installed in a contrasting color shall be applied to the finished floor a minimum of 12" from the outer edge of the penetration. A sample of the proposed signage and marking is shown below.

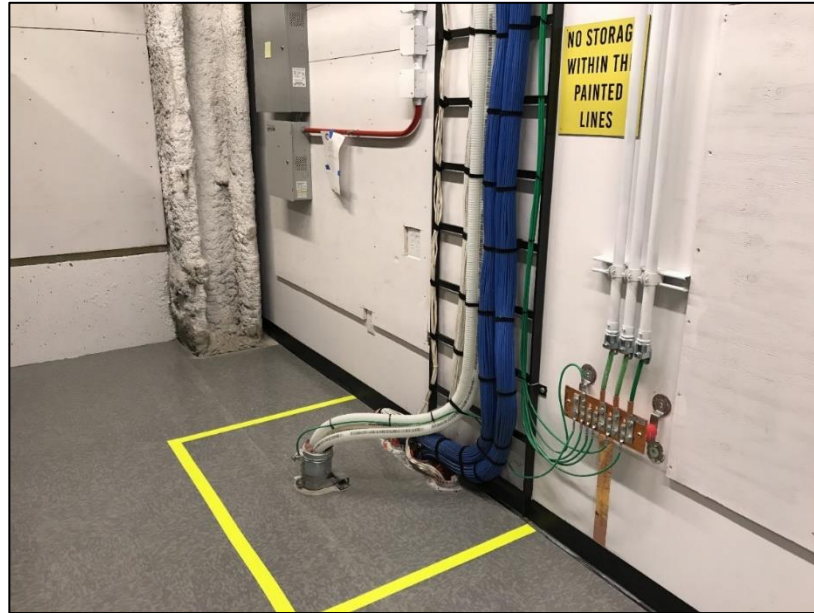


FIGURE 1: SAMPLE SIGN AND PAINTED LINES SURROUNDING PENETRATION

In order to establish a minimum proposed separation distance, similar applications were examined within the NFPA standards that could be applied. NFPA 13, Standard for the Installation of Sprinkler Systems, 2016 Edition Table 8.3.2.5 (C) shows the recommended separation distance of a sprinkler from an adjacent heat source. Note that the activation temperatures of the sprinklers (ordinary temperature 135-170°F and intermediate temperature sprinkler 175-225°F) are much lower than the ignition temperature of cotton (400°F). The 12" specified are shown as being adequate for coal- or wood-burning stove, hot air flue, or uninsulated hot water pipes and ducts. This application does not have a radiant heat source such as an open flame in a fireplace so those data points were not utilized in this analysis.

TABLE 8.3.2.5(c) Temperature Ratings of Sprinklers in Specified Residential Areas

<i>Heat Source</i>	<i>Minimum Distance from Edge of Source to Ordinary-Temperature Sprinkler</i>		<i>Minimum Distance from Edge of Source to Intermediate-Temperature Sprinkler</i>	
	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>
Side of open or recessed fireplace	36	914	12	305
Front of recessed fireplace	60	1524	36	914
Coal- or wood-burning stove	42	1067	12	305
Kitchen range	18	457	9	229
Wall oven	18	457	9	229
Hot air flues	18	457	9	229
Uninsulated heat ducts	18	457	9	229
Uninsulated hot water pipes	12	305	6	152
Side of ceiling- or wall-mounted hot air diffusers	24	607	12	305
Front of wall-mounted hot air diffusers	36	914	18	457
Hot water heater or furnace	6	152	3	76
Light fixture: 0 W–250 W	6	152	3	76
250 W–499 W	12	305	6	152

Maine Medical is proposing to apply this approach primarily within electrical rooms, IT rooms, and open mechanical rooms where the installation does not already qualify for one of the T rating exceptions previously noted which are allowed within the code. If the specific conditions of the proposed alternative compliance option cannot be met, a T rating solution will be required.

Conclusion

This alternative approach has been approved by the Permitting and Inspections Department for Portland. This letter serves as a means of communication for coordination between the City of Portland and the State Fire Marshal's Office to ensure continuity and understanding among all responsible authorities.

Sincerely,
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1/31/2019

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1/31/2019

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