

ATTACHMENT E

Life Safety Plan



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Date: 29 January, 2014

Memo Report

From: W. Mark Cummings, P.E.

To: Mr. Steve Bushey, Fay, Spofford, & Thorndike

CC:

Subject: Updated Fire Protection Review of Site Plans, ICW The Forefront at Thompson's Point

As requested, Fire Risk Management, Inc. (FRM) reviewed the information you provided with regards to the updated site plans for the new development at Thompson's Point in Portland, ME. The focus for this review was to further evaluate the fire protection features of the general layout for the proposed development to ensure that all State and Municipal codes, regulations, and ordinances are adequately addressed.

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

1. The City of Portland Code of Ordinances; primarily Chapter 10, *Fire Prevention and Protection*, (Rev. 1-20-11),
2. City of Portland Technical Manual, Section 3 – Public Safety, (Rev. 6/17/11),
3. City of Portland Fire Department Rules and Regulations, and
4. National Fire Protection Association (NFPA) 1, the Fire Code[®] (2012 ed.).

For this review, the primary areas of interest are to ensure that an adequate water supply is available; including location and spacing of the new fire hydrants along the proposed private fire service main and that proper access to the various structures by firefighting equipment and personnel is available. The primary documentation reviewed in support of this evaluation included;

1. The Forefront at Thompson's Point Master Fire Protection Plan; Dwg C-6.00,
2. The Forefront at Thompson's Point Master Plan; Dwg C3.00, and
3. The Forefront at Thompson's Point Master Plan Application submittal package.

Although no updated fire water supply system data have been requested from the Portland Water District (PWD), the data provided for the previous review of this development indicated that the water supply to the site for the new development should be more than adequate to support the requirements outlined by NFPA 1, Ch. 18. Based on the most recent building construction data provided, it is understood that the new buildings being constructed will generally consist of Type IB or IIA construction and will comply with the requirements of the Maine Uniform Building and Energy Code (MUBEC), which mostly follows the requirements outlined in the International Building Code (IBC). The existing buildings that are identified to remain will generally meet a Type IIIB construction classification, as defined by the IBC. Equally, it was discussed that the construction plans call for all new buildings to be fully protected with automatic fire sprinkler systems and most, if not all, existing structures are likely to be retrofitted with a fire sprinkler system as part of their renovations. Some discussion indicated that since building B1 was planned to be an "open air" structure, this facility might not be provided with a fire sprinkler system. Given the type of occupancy classifications, along with the size and construction classifications for all buildings that are proposed for this development, the overall fire flow (firefighting water supply) requirements for each of the buildings, as defined by the requirements in NFPA 1, have been estimated. It is estimated that the "worst-case" demand will likely be that for both the Garage (building F1) and the Office building (building J1). Based strictly on the fire flow areas for these structures, along with a likely requirement that they will consist of Type I or II construction, a minimum fire flow demand of 4250 gpm

for four (4) hours would be required for each. However, given that these structures are planned to be fully sprinklered, this flow value can be reduced by 75%; to less than 1100 gpm. If building B1 is not to be provided with a fire sprinkler system, this building would then represent the worst case demand for the water supply system; 2500 gpm for two (2) hours. The hydrant flow test data previously provided by the PWD indicated that the 12" supply main serving this site can support more than 6000 gpm at the minimum of 20 psig residual pressure, which is used as that needed to be defined as "fire flow." No restriction was listed with regards to the duration for which this flow could be provided. As such, the existing water supply system for the City of Portland should have no problem acting as the primary source of fire water supply for this new development.

Based on the total fire flow demand, NFPA 1 (Annex E) would allow for a minimum spacing of either 450 ft or 500 ft between each hydrant, as measured along the fire department access road(s)¹. Ultimately, this will depend on whether or not all buildings are provided with sprinkler systems. If, for example, building B1 is not provided with a fire sprinkler system and the requisite fire flow demand is 2500 gpm, the hydrant spacing should be no more than 450 ft along the various access roads; otherwise, the 1100 gpm demand would allow for a 500 ft spacing. Although the current Master Fire Protection Plan was developed using a maximum spacing of 500 ft between hydrants, most are already shown on the plan as not being greater than 450 ft apart and where those that may be slightly more than this distance, the final hydrant locations can easily be adjusted, if/as necessary, to meet this requirement without the need for additional hydrants. Equally, for any hydrant that is considered to be located along a "dead-end" street/access roadway/etc., the distance from any point measured along that street/roadway to a hydrant should not exceed 200 ft. Using these requirements and the information provided on the Master Plan drawings, it appears that the proposed hydrant locations that are adjacent to buildings J1 and J2 (northwest corner of the development) may need to be adjusted slightly to fully comply with this requirement. However, since this can easily be accomplished within the design of the final site plan, it would not be recommended that changes to this current layout occur until the overall site plan is finalized; including building sizes and locations and a definite determination of whether any buildings will not receive a fire sprinkler system.

The Portland Fire Department Rules and Regulations include additional requirements regarding the placement of hydrants. This includes a requirement that the Fire Department Connection(s) (FDCs) for each building must be within 100 ft of a hydrant. Additionally, NFPA 24 (along with the City) has a requirement that no hydrant should be located within 40 ft of a structure. Since the level of detail for the individual buildings provided at this point in the design process is such that it is not known where the FDCs will be located for each building, it cannot be determined as part of this review whether or not this requirement will be met. However, in other recent projects, the City has agreed to "waive" the requirement for a hydrant to be within 100 ft of the FDC; primarily since the genesis of this requirement isn't fully understood and this is not a "typical" requirement for most other municipal Fire Departments. It is understood that the hydrant that is currently depicted as being located adjacent to building H is within 40 ft of this structure. However, as discussed in a number of teleconferences between FST and FRM, it is recommended that this current location be retained. It is understood that the proximity of the access road along these buildings is so close to the property line that a hydrant cannot be installed on the other side of the access road. However, installation of the hydrant at this location has a greater advantage in meeting the overall water supply requirements for the site than the disadvantage of its close proximity to building H. Its removal would then result in the inability to meet the maximum spacing between hydrants. Given that if a fire is within building H, other hydrants are readily available to support firefighting operations, it is considered that the plan to install this hydrant in this location represents the best option for providing the overall site with adequate fire protection. Where it may be in the best interests of the overall firefighting plan for a building/site, the codes do allow for the Authority Having Jurisdiction (AHJ) to accept hydrant locations within the 40-foot limit.

NFPA 1 also requires that any portion of a building, or the exterior walls of the building, can be no more than 450 ft from an access road when the facility is fully protected by an automatic sprinkler system; it cannot be more than 150 ft if not sprinklered. Based on a review of the site plan, it appears that this requirement will easily be met. In addition to this requirement, NFPA 1 also requires that at least one exterior door for each building is within 50 ft. of an access

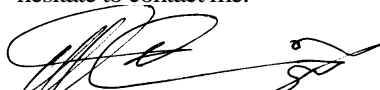
¹ Although FRM used the most recent edition of NFPA 1 for this review, no changes occurred from the previous edition that would alter the calculations/requirements used for this review.

roadway. The drawings provided for this review did not provide a level of detail for the individual buildings that would include locations for all available exterior doorways; albeit based on the locations of the roadways, driveways, and parking lots depicted on the Master Plan, it appears that this requirement too will easily met. However, it will still be necessary to ensure that during the design process for the individual buildings, that this requirement is accommodated.

Chapter 10 of the Portland City Ordinances has a requirement that, where available, the fire department vehicles should have access to at least two (2) sides of each building. Based on the current site plan provided, it will be possible for all buildings to be accessed from at least two sides. Both NFPA 1 and the City's regulations also include requirements for any "dead-end" access road greater than 150 ft to provide a means for fire department apparatus to turn-around. The only portion of the site access roads where this restriction applies is that section that provides access to building J2. The current Master Plan includes a general turn-around area on the west side of building J2. It will be necessary to verify that the final design for this turn-around will be compliant with the City's requirements. The City of Portland's Technical Manual includes a figure that generally depicts the recommended layout for this turn-around (Figure I-5).

Although this development is provided with only a single access point, the design of this roadway will far exceed the minimum requirements outlined by the City's Ordinances (20 ft minimum width where ladder truck may be needed). Unfortunately, the topography and the presence of a railway that isolate Thompson's Point from the remainder of the land mass restrict the ability to provide a second access point to this site. However, given the current plans for the access roadway design, having a single access is not considered to provide any significant increase in risk.

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



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