BUILDING, FIRE & ACCESS, INC.

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BIG E

NEW HAMPSHIRE BUILDING

1305 MEMORIAL AVE, WEST SPRINGFIELD, MA 01089

Preliminary Chapter 34 Investigation & Evaluation Report

Prepared For:

New Hampshire Department of Agriculture, Markets and Food
Division of Agricultural Development
PO Box 2042
Concord, NH 03302-2042

NH 20-001

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Executive Summary

Big E is an existing building located on the Big E campus in Springfield, MA. It contains a large exhibition hall, administrative offices, and dormitory areas for exhibitors and staff. The facility is open and used for only a few weeks each year during the Big E annual show. The intent of this report is to provide some background on existing state of compliance and code compliance considerations that should be addressed as a priority given existing conditions.

780 CMR Retroactive Provisions	As an existing building, the Massachusetts State Building Code (780 CMR) has limited provisions retroactively applicable to existing buildings. These provisions are found in Chapter 1 and relate to minimum egress capacity and number of exits, exit arrangement and minimum lighting and ventilation.
780 CMR Chapter 34 **Existing Building Code Method**	All other provisions of 780 CMR as applicable to existing buildings is dependent on permitted work being proposed or performed. Chapter 34 of 780 CMR addresses existing building provisions based on work to be performed. 3 options are offered: 1. The Prescriptive Method 2. The Work Area Method and 3. The Performance Method The Work Area Method would be the preferred method to use until emergency responder radio coverage and sprinklers are provided throughout the building.
Uses	Assembly, A-3 — Exhibition Hall Business, B — Offices Residential, R-1 — Dormitory (R-1 because users stay is less than 30 days and therefore considered transient)
Special Uses	The sleeping rooms are considered special uses. It is assumed that there are no hazardous materials in the building except those permitted under an exempt quantities/control area approach (i.e. no hazardous use classifications).
Historic	The building is historic.
Mixed Use Approach	A non-separated mixed use is assumed given the lack of separations noted.
Risk Category	Per Table 1604.5, the building is considered a risk category III (Assembly with aggregate occupant load greater than 300).
General Building Height & Area	The main portion of the building has 3 stories. The exhibition hall is a single story (Double height space). The building is <70 feet in height above grade plane. As an existing building that is not undergoing a change in use or addition, the existing height and area is deemed compliant.
Construction Classification	Most closely resembles Type IIIB, Noncombustible exterior walls, Non-Rated Construction (based on visual observation). The building is largely nonrated, noncombustible construction; however, some wood assemblies were noted. The exterior bearing walls are masonry and 2 hour rated based on the calculation methods in Section 722. Based on this information, Type IIIB Construction is the highest classification which can be assigned.

Fire Walls or Separation Walls	No fire walls or separation walls were noted.
Exterior Walls & Openings	If no changes are proposed, the existing exterior walls and openings are "presumed" compliant with code in effect at the time of construction. The building is afforded setbacks of at least 20 feet which would allow unlimited unprotected openings.
Sprinklers	The building is not equipped with sprinklers.
Standpipes	The building is not equipped with standpipes.
Fire Extinguishers	The building is equipped with fire extinguishers.
Fire Alarm System	A fire alarm system is provided with radio transmission for monitoring by Fire Department. This consists of manual pull stations, smoke detection and CO detection.
Emergency Responder Radio Coverage	Emergency responder radio coverage is not provided.

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INTRODUCTION

BACKGROUND

The New Hampshire Department of Agriculture, Markets and Food has retained Building, Fire & Access, Inc. to provide fire protection, life safety, and accessibility consulting services to review the New Hampshire Building Big E. This report serves as a Preliminary Chapter 34 Investigation & Evaluation Report for the building. The term preliminary is used because the ultimate code application is dependent on proposed work which has not yet been identified. For the purpose of this report, the following scenarios are considered:

a. Identify existing deficiencies in terms of minimum egress compliance,
b. Consider a Repair project,
c. Consider a Level 1 Alteration project,
d. Consider a Level 2 Alteration project, and
e. Consider a Level 3 Alteration project.

APPLICABLE CODES

The following primary codes are applicable to this project:

- **Accessibility** - Massachusetts Architectural Access Board, 521 CMR and the Americans with Disabilities Act 2010 ADA Standards for Accessible Design (2010 ADASAD).

- **Building** - Massachusetts State Building Code Ninth Edition, 780 CMR. 780 CMR is an amended version of the 2015 International Building Code.

    - **Existing Building Code** - International Existing Building Code, 2015, as amended by 780 CMR (IEBC).
    - **Mechanical** - International Mechanical Code, 2015, as amended by 780 CMR (IMC).
    - **Energy Conservation** – 2018 International Energy Code as amended by 780 CMR (IECC).

- **Fire Prevention** - Massachusetts Fire Prevention Regulations, 527 CMR. 527 CMR is an amended version of the 2015 National Fire Code, NFPA 1.

    - **Electrical** - Massachusetts Electrical Code, 527 CMR 12.00. The Massachusetts Electrical Code is an amended version of the 2017 National Electrical Code (NFPA 70).

This report focuses on the key issues relative to compliance with 780 CMR.

ASSUMPTIONS

The code review and report have been completed based on the assumption that if any hazardous materials are to be located within the building now or in the future, the amount of such materials will be limited to the exempt amounts permitted by 780 CMR using a control area method.

EXISTING CONDITIONS SUMMARY

Building Uses	Assembly (A-3), Business (B) & Residential (R-1)
Historic	The building is historic.
Construction	Type IIIB, Noncombustible
Building Height	3 stories above grade
Building Area	Approx. 40,000 gsf in the aggregate
Risk Category	III (Assembly with Occupant load > 300)
Fire Protection	The building is not provided with sprinklers or standpipes. A fire alarm system is provided. Fire extinguishers are provided. An emergency responder radio coverage system is not provided.

780 CMR AND 527 CMR RETROACTIVE REQUIRMENTS

In general, 780 CMR & 527 CMR do not have retroactive provisions except as follows:

1. **Maintenance Provisions (780 CMR 102.8 and 527 CMR 1.03)**
   Maintenance provisions can be enforced to require any work necessary to maintain compliance with codes at the time of construction or last substantial renovation.

2. **Existing Means of Egress, Lighting and Ventilation (780 CMR 102.6.4)**
   This provision may be enforced regardless of compliance at the time of original construction or last substantial renovation. The provision is specifically intended to ensure minimally:

   a. Adequate number of exits
   b. Adequate exit capacity
   c. Adequate exit arrangement
   d. Adequate lighting
   e. Adequate ventilation

   If in the opinion of the building code official any of these are not adequate, abatement orders may be issued.

REVIEW

The exhibition area is compliant with items a through e in my professional opinion.

- Approximate occupant load = 500-600 persons,
- 3 exits are required, and 3 exits are provided.
- The 3 exits provide with capacity for 840 persons.
- Exit arrangement meets travel distance, common path of travel and other exit access arrangement criteria. All exits are accessible via a “racetrack” pattern of large aisles that connect to two pair of rear doors and to front doors.
- Adequate lighting and ventilation are presumed based on visual observation of fixtures and equipment.

The Second Level is compliant with items a through e in my professional opinion.

- Approximate occupant load = 30-50 persons (3,300 gsf @ 1/100 gsf/person = 33),
- 2 exits are required, and 2 exits are provided.
- The 2 exits provide capacity for 100 persons (2 ea. 36" wide staircases).
- Exit arrangement meets travel distance, common path of travel and other exit access arrangement criteria
- Adequate lighting and ventilation are presumed based on visual observation of fixtures and equipment.

The Third Floor is compliant with items a, b, d and e in my professional opinion.

- Approximate occupant load = 66-75 persons (3,300 gsf @ 1/50 gsf/person = 66),
- 2 exits are required, and 3 exits are provided (2 internal stairways and 1 fire escape from the exhibition roof; there are 3 sleeping rooms and each is provided with and exit door to the exhibition roof; from there they converge to a 1 story fire escape to grade).
- The 3 exits provide capacity for 150 persons (50 per staircase and 50 per the fire escape).
- Adequate lighting and ventilation are presumed based on visual observation of fixtures and equipment.

However, item c is not satisfied based on:

1. The limited aisle accessways provided between beds to reach the exit doors from each sleeping room,
2. Steps up to the roof right at the doors,
3. Door hardware,
4. Emergency egress lighting, and
5. Exit Signage.

RECOMMENDATIONS

The above items are considered Priority 1 and should be addressed as soon as possible and before the dormitories are occupied again.

1. Minimum 36" clear aisles should connect all exit doors and the stairs. This path must be maintained unobstructed at all times.
2. While the steps up to the roof must remain, contrasting marking and warning signs should be provided.
3. All dead bolts should be removed from doors.
4. All knobs should be replaced with lever type handles.
5. Additional emergency egress lighting should be provided to ensure the minimum lumens are provided at the floor (1 foot-candle at the floor) and the emergency lighting is provided for the path across the roof and at the exit discharges.
6. Replace all paper exit signs with internally illuminated exit signs.
7. Remove all storage from the 3rd and 2nd Floors.

In addition to the above to meet minimum egress criteria, the following items are considered Priority 2 items which, if completed, will improve the overall life safety for occupants during their stay.

8. Replace outdated fire escape with a full size exterior stairway.
9. Create smoke tight partitions between each sleeping room and between the 2nd and 3rd Floors. Namely doorways should be replaced to create tight fitting barriers at the internal stairways and the doorways separating the sleeping rooms from the other areas of the 3rd Floor.
10. Improve Stairway guardrails by increasing height to 42".
11. Retrofit automatic sprinkler protection throughout the 3-story portion at a minimum, but throughout the exhibition hall as well.

SPRINKLER CONSIDERATIONS

MASSACHUSETTS GENERAL LAW CHAPTER 148 SECTION 26G

The Massachusetts General Law Chapter 148 Section 26G (M.G.L.c.148 §26G) is the state's enhanced sprinkler law. The building is not compliant with M.G.L.c.148 §26G. However, the law as it applies to existing buildings does not require sprinklers unless 33% of the building value is spent on work in a 5 year period.

780 CMR CONSIDERATIONS

As an existing building, 780 CMR Chapter 34 is applicable. 780 CMR Chapter 34 is an amended version of the 2009 International Existing Building Code (IEBC). Chapter 34 requires a project to comply with one of three permissible methods (780 CMR 101.5): 1) The Prescriptive Method, 2) The Work Area Method, or 3) The Performance Method.

The prescriptive method requires a minimum set of criteria be satisfied before it may be used. It is noted that under the 9th Edition of 780 CMR Chapter 34 (IEBC 2015), an Emergency Responder Radio Coverage System will be necessary to use the Prescriptive Method. Therefore, this method is not recommended unless an emergency responder radio coverage system is installed. Springfield Fire Department will have a specific set of criteria which needs to be satisfied for such a system.

The Performance Method entails a point system evaluation to assess if a minimum level of safety is achieved. Based on the limited features at the existing building, insufficient points are available to make the Performance Method viable (notably, without a fire sprinkler system the required point value is not achieved).

The Work Area Method would be the preferred method to use until emergency responder radio coverage and sprinklers are provided throughout the building.

Sprinklers would not be required under the Work Area Method unless a Level 2 Alteration or Higher work classification occurs. In layman's terms, more than half a floor would need to be altered.

CONCLUSION

Sprinklers are not required unless appreciable work is completed and/or dollars are spent. That said, the life safety benefits of sprinklers are superior to any other improvement that can be made for the dormitories.

Figure 1 - Obstructed Door and Noncompliant Exit Sign

Figure 2 - Same as Figure 1 but Further from Door

Figure 3 - Exit Aisles between Beds is Insufficient

Figure 4 - Another Exit Door Obstructed and Noncompliant Exit Sign

Figure 5 - Internal Stairway 1 and Enclosure which is not Smoke-Tight

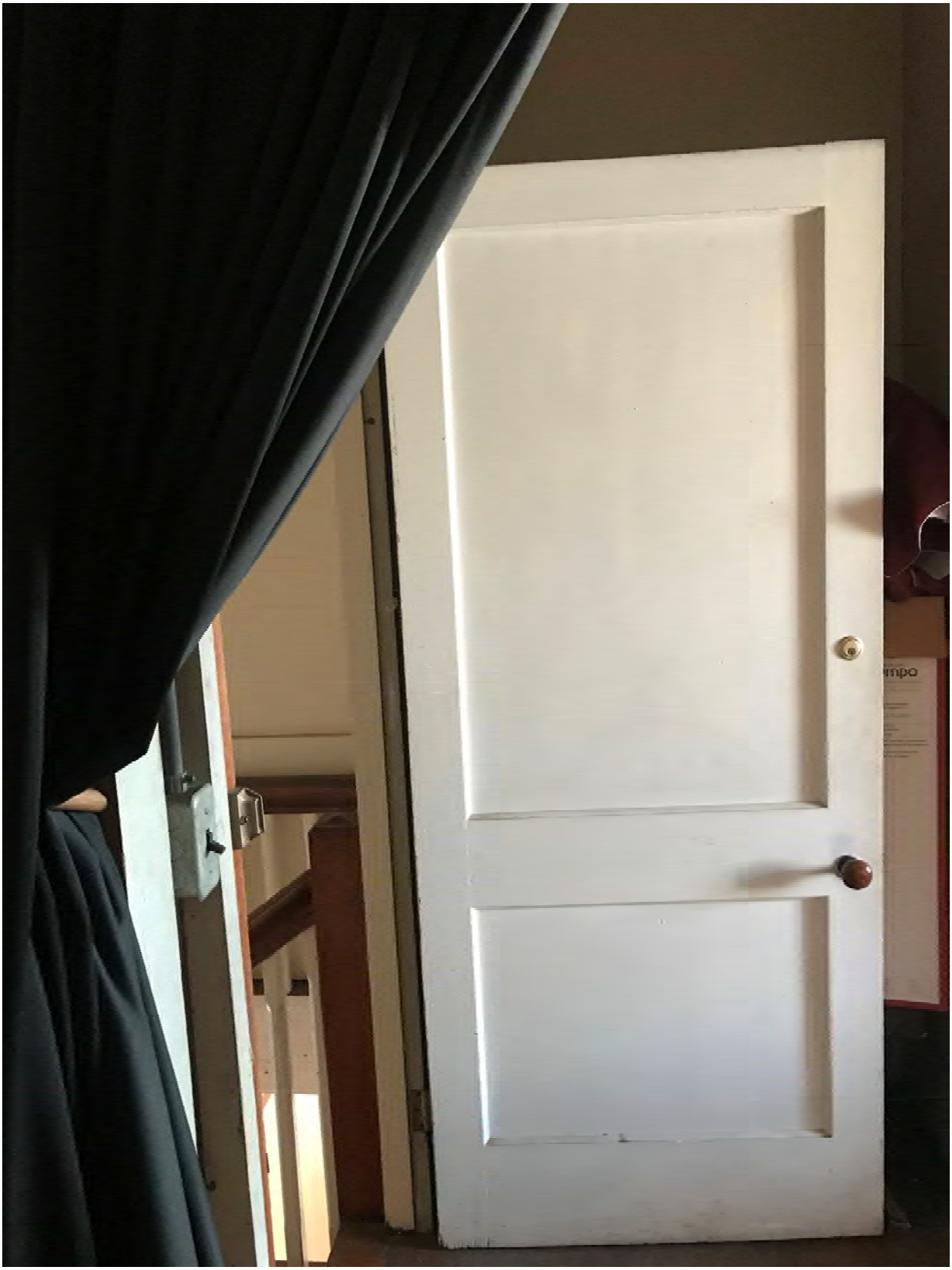

Figure 6 - Noncompliant door hardware and Unpermitted Dead Bolt

Figure 7 - Move Wardrobe Units and Curtain to Maintain Clear Path to Stairs

Figure 8 - Doors to Exhibition Roof

Figure 9 - Internal Stairway #2

Figure 10 - Exit Doors to Roof (Exterior)

Figure 11 - Path from Doors to Fire Escape

Figure 12 - Fire Escape at Rear of Building

Figure 13 - Fire Escape at Rear of Building

END OF REPORT