



154 TURNPIKE ROAD SUITE 200, SOUTHBOROUGH MA 01772

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**Former Sylvester School
495 Hanover Street
Hanover, MA 02339**

Existing Building Code Report

October 29, 2019

Prepared for:

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**CODE CONSULTING - FIRE PROTECTION ENGINEERING
CONSTRUCTION ADMINISTRATION - PERFORMANCE-BASED DESIGN**

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1. Introduction & Project Description

CBI Consulting, Inc. has retained Code Red Consultants to provide fire protection and life safety code consulting services for the Former Sylvester School renovation project in Hanover, MA. This report describes our evaluation of the existing building in accordance with 780 CMR 34.00 and the code compliance approach associated with the proposed work. Additionally, this report has been prepared to satisfy the provisions of The Existing Building Code of Massachusetts Section 104.2.2.1 which requires existing buildings undergoing work to be investigated and evaluated in accordance with the requirements of the code. This report is required to be included in the permit submittal to the building official.

Originally constructed in 1927, Sylvester School is an existing elementary school that is 2 stories above grade, including a basement level, with an approximate footprint and aggregate area of 13,000 sf and 39,000 sf, respectively. The structure is composed of mixed noncombustible and combustible framing components and masonry exterior walls. The Sylvester School building contains classrooms, administration offices, a gymnasium, a cafeteria and associated kitchen, and storage/support spaces. The building no longer serves as an elementary school and is currently unoccupied. The building is equipped throughout with a fire alarm and detection system. No fire sprinkler system is provided for the building.



FIGURE 1: EXTERIOR VIEW OF EXISTING BUILDING

The proposed project consists of the renovation and potential change of use within the existing elementary school which is proposed to be converted to school administration offices, DPW offices, municipal training, and special education classroom space. It is assumed that multiple tenants will occupy the building.

The purpose of this report is to document the condition of the major fire protection and life safety systems in the building and identify key code threshold that could trigger retroactive upgrades to the building. A detailed Investigation and Evaluation report required to be submitted with the permit documents following definition of a specific scope of work.

2. Applicable Codes

Building Code	780 CMR - Massachusetts State Building Code 9 th Edition, which is an amended version of the 2015 International Building Code (IBC). 780 CMR 34.00 is deleted and replaced by the Massachusetts Existing Building Code (MEBC), which is an amended version of the 2015 International Existing Building Code (IEBC).
Fire Code	527 CMR - Massachusetts Comprehensive Fire Safety Code which is an amended version of the 2015 Edition of NFPA 1, Fire Code with specific updates from the 2018 Edition of NFPA 1.
Plumbing Code	248 CMR 10.00 - Uniform State Plumbing Code.
Electrical Code	527 CMR 12.00 - Massachusetts Electrical Code, which is an amended version of the 2017 Edition of NFPA 70, National Electrical Code.
Mechanical Code	2015 Edition of the International Mechanical Code (IMC) as amended by 780 CMR 28.00.
Energy Code	2015 ¹ International Energy Conservation Code (IECC) as amended by 780 CMR 13.00.
Elevator Code	524 CMR - Massachusetts Board of Elevator Regulations, which adopts and amends the 2013 Edition of ANSI A 17.1, Safety Code for Elevators and Escalators.
Accessibility Regulations	521 CMR - Architectural Access Board (AAB) Rules and Regulations 2010 ADA Standards for Accessible Design
Other	Various National Fire Protection Association (NFPA) codes and standards as referenced by the codes listed above.

This report addresses the key features of these codes and standards. The primary intent of this document is to (1) coordinate the fire protection and life safety approach between all design disciplines, (2) demonstrate building, fire and life safety code compliance to the Authorities Having Jurisdiction, and (3) serve as a record document for the building owner. This report is intended to address code requirements as enforced by Authorities Having Jurisdiction only. It is the responsibility of the design team to ensure that any owner or insurance carrier requirements, which may exceed the provisions of the applicable codes and standards, are met.

¹ It is our understanding that the 2018 IECC will be adopted and enforced outright in January 1, 2020. The applicable Energy Code will vest with the date of permit application for the project.

3. Existing Building Summary

<u>Use and Occupancy</u>	<u>Primary Use(s):</u> Group E, Educational (Elementary School)	<u>Accessory Use(s):</u> Group B, Business (Administrative Offices) Group S-2, Storage/MEP
<u>Height & Area</u>	2 stories above grade including basement level Footprint area: 13,000 SF Aggregate area: 39,000 SF	
<u>Construction Type</u>	Type IIIB – Unprotected noncombustible and combustible structural components and exterior brick masonry wall.	
<u>Special Uses</u>	The building contains a stage within the auditorium that is classified as a special use in accordance with 780 CMR Section 410.	
<u>Vertical Openings</u>	The existing vertical openings in the building consist of the following: <ul style="list-style-type: none"> • Stair and MEP shafts with masonry construction. The exit enclosure doors were unlabeled. • Double height gymnasium 	
<u>Means of Egress</u>	The First Floor is provided with five exits to grade. The Basement Level is served by 3 exit stairs and the Second Floor is served by 2 exit stairs, all of which discharge directly to the exterior.	
<u>Fire Protection Systems</u>	The building is not provided with sprinkler protection.	
<u>Fire Alarm System</u>	The building is served by a fire alarm system which includes manual pull stations, audible/visual notification devices, and partial heat/smoke detection.	
<u>Exit Signage and Emergency Lighting</u>	Provided throughout building with secondary power supplied via battery back-up.	
<u>Plumbing Fixtures</u>	The building contains female and male toilet rooms on each floor. Accessible toilet rooms were not provided.	

4. Existing Building Scoping Requirements

4.1 General Requirements

Portions of an existing building undergoing repair, alteration, addition, or a change of occupancy are subject to the requirements of the MEBC. In general, existing materials and conditions can remain provided they were installed in accordance with the code at the time of original installation and are not deemed a hazardous condition by an authority having jurisdiction (AHJ). Work to existing buildings is required to be performed in accordance with 780 CMR for new construction unless otherwise specified by the MEBC. Alterations to existing buildings are not permitted to reduce the level of safety currently provided within the building unless the portion altered complies with the requirements of 780 CMR for new construction.

Where compliance with the requirements of the code for new construction is impractical due to construction difficulties or regulatory conflicts, compliance alternatives may be approved by the building official. Any compliance alternatives being sought are required to be identified on the submittal documents (MEBC 104.11).

4.2 Compliance Method & Classification of Work

The MEBC has 3 different compliance methods that can be used to evaluate a renovation project:

- Prescriptive Method (MEBC Chapter 4)
- Work Area Method (MEBC Chapters 5-13)
- Performance Method (MEBC Chapter 14)

Based on our review and understanding of the existing conditions, the **Work Area Method** has been selected for use on this project (MEBC 301.1). The project includes the renovation to the existing building, which may consist of the reconfiguration of spaces, new interior finishes, and MEP upgrades. The project may also include a **Change of Occupancy** from Group E, Educational use to Group A-3, Assembly and/or Group B, Business. It is our understanding that less than 50% of the existing building will be reconfigured. Therefore, the planned work is classified as a **Level 2 Alteration** and a **Change of Occupancy**, as defined below.

Level 2 Alterations: Renovations where the work area does not exceed 50% of the aggregate building area and includes the reconfiguration of interior spaces, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of new equipment. Level 2 Alteration projects are required to comply with MEBC Chapters 7 and 8 (MEBC 504).


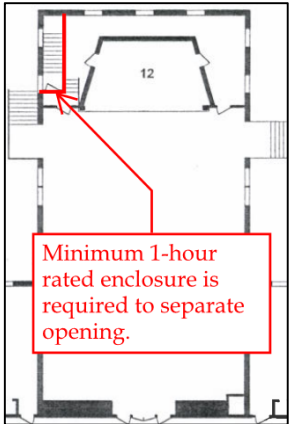

Change of Occupancy: A change in the use of the building or a portion of the building. A change of occupancy includes any change of occupancy classification, any change from one group to another group within an occupancy classification, or any change in use within a group for a specific occupancy classification. Buildings undergoing a change of occupancy are required to comply with MEBC Chapter 10 (MEBC 506).



4.3 Existing Hazardous Conditions



Regardless of the scope of work performed, the building official may cite any of the following conditions as hazardous, and require them to be mitigated or made safe (780 CMR 102.6.4):



- Inadequate number of means of egress.
- Egress components with insufficient width or so arranged to be inadequate, including signage and lighting.
- Inadequate lighting and ventilation. Lighting levels and ventilation are to be provided for egress systems such that they are maintained as usable.



It is our understanding that no conditions have been cited as hazardous by the Town of Hanover. The table below summarizes observed deficiencies during the site survey on the October 17, 2019. While the following list is only required to be addressed where cited as hazardous, it is recommended that the noted deficiencies be captured where possible within the design.

Condition	Requirement	Recommended Corrective Action	Photo
The stairway connecting the double height gymnasium to the cafeteria in the Basement is provided with a non-rated door that is neither self-closing nor latching. This condition essentially creates an unprotected three-story vertical opening between the Basement and Second level	Two-story openings are required to be separated from openings serving other floors by construction conforming to required shaft enclosures.	It is recommended that the wood door be replaced with a minimum 1-hour fire door complying with 780 CMR Section 716 if sited as hazardous by the building official. If the stairway is within the work area or a change of occupancy occurs, a fire door that is self-closing and latching is required (MEBC 803.2.1 & 1012.7.4).	 
Classrooms, toilet rooms, and administrative offices open directly onto the exit stair enclosures with non-rated doors that are not self-closing and latching.	Openings in interior stairways are required to be protected by fire doors complying with 780 CMR Section 716. (780 CMR 1014.7).	It is recommended that the wood door be replaced with a minimum 1-hour fire door complying with 780 CMR Section 716 if sited as hazardous by the building official. If the stairway is within the work area or a change of occupancy occurs, a fire door that is self-closing and latching is required (MEBC 803.2.1 & 1012.7.4).	

Condition	Requirement	Recommended Corrective Action	Photo
Some of the exit doors were observed to be blocked and unavailable for use.	Means of egress from all parts of the building are required to be maintained free and unobstructed (527 CMR 4.4.3.1.1).	The temporary enclosure blocking the egress doorway should be removed as part of the project.	
Fire extinguishers were missing in designated locations.	Fire extinguishers are required to be placed such that the travel distance from any point in the building to an extinguisher does not exceed 75 feet (NFPA 10, 6.2.1.2.2; 780 CMR 906.3(1)).	It is recommended that fire extinguishers be reinstalled in designated locations in accordance with NFPA 10.	

Condition	Requirement	Recommended Corrective Action	Photo
The doors opening into the stair enclosures were not provided with a fire door label.	Fire doors and frames are required to bare a label affixed on the door and frame so it can be easily identified as a fire-rated door (780 CMR 716.5; NFPA 80, 4.2.1). The label is permitted to be of metal, paper, or plastic and can be stamped or diecast directly into the door or frame.	A 1-hour fire door label should be provided if the condition is cited as hazardous by the building official or if the stair doors are replaced.	
The doors opening into the stair enclosures were propped open and not capable of self-closing and latching.	Fire doors are required to be equipped with a closing device that automatically self-closes and latches upon release (780 CMR 716.5.9.1).	All manual devices that prohibit the stair doors from closing should be removed as part of the project. Additionally, latching hardware (i.e. fire exit hardware) should be provided if the condition is cited as hazardous by the building official or if the stair doors are replaced.	

Condition	Requirement	Recommended Corrective Action	Photo
Large quantities of combustible storage were observed in a non-dedicated storage room.	Rooms or spaces are not permitted to be used for other than its intended use unless the fire protection systems protecting the room or space are sufficient for the hazards present.	It is recommended that the excessive storage be removed or relocated to a dedicated storage room as part of the project.	
Winder treads are used to provide vertical access to the stage.	Stairways that serve as part of the means of egress are required to have uniform treads and risers (780 CMR 1011).	A stairway having uniform treads and rises should be installed at the stage if the condition is cited as hazardous by the building official.	

Condition	Requirement	Recommended Corrective Action	Photo
The door opening into the mechanical room in the Basement was non-rated and not capable of self-closing and latching.	Rooms containing equipment over 400,000 Btu/hr or boilers over 15 psi and 10 hp are required to be separated from the balance of the building by 1-hour fire rated construction or be provided with sprinkler protection (780 CMR 509).	It is recommended that the door be replaced with a fire door that is self closing and latching if cited as hazardous by the building official or if the door is replaced. If the building is fully sprinkler protected as part of the project, no action is required.	
Corridor doors were not self-closing.	Non-sprinklered buildings containing Group E occupancies are required to have fire-resistance rated corridors in accordance with 780 CMR 1020. Doors within corridors walls are required to be self-closing and latching.	A self-closing device is required to be installed on corridor doors if (1) the building remains non-sprinklered and (2) cited as hazardous by the building official.	

5. Fire Protection / Life Safety Analysis

The following analysis has been prepared to illustrate compliance with the requirements of the MEBC and 780 CMR based on the compliance method and classification of work identified in Section 4.2. This section of the report focuses on the existing building code requirements in conjunction with the requirements from 780 CMR for new construction as applicable to the project. In general, new work is required to comply with the new construction requirements of 780 CMR unless otherwise stated herein (MEBC 801.3).

5.1 Use and Occupancy Classification

5.1.1 Primary Occupancy Groups

- 5.1.1.1 Following the project, it is proposed that the building contain the primary occupancies listed in Table 1.

Occupancy Groups (780 CMR 302)	
Occupancy	Use
Conference rooms, training areas	Group A-3, Assembly
Offices & Conference Rooms < 750 sf	Group B, Business
Special Education	Group E, Educational

TABLE 1: PRIMARY OCCUPANCY CLASSIFICATION

- 5.1.1.2 The building is classified as non-separated mixed-use (780 CMR 508.3).

5.1.2 Accessory Occupancies

- 5.1.2.1 Table 2 indicates accessory occupancies that are ancillary to the primary occupancies within the building. Accessory occupancies do not occupy more than 10 percent of the building area of the story in which they are located (780 CMR 508.2.1).

Accessory Occupancy Groups (780 CMR 302)	
Occupancy	Use
Storage/MEP Rooms	Group S-2

TABLE 2: ACCESSORY OCCUPANCY GROUPS

- 5.1.2.2 Accessory occupancies are required to comply with the provisions of the 780 CMR based on the occupancy classification of the space (780 CMR 508.2.1). The allowable height of a building is based on the primary occupancies (780 CMR 508.2.2).
- 5.1.2.3 No separation is required between accessory occupancies and the primary occupancies unless required by other sections of this report (780 CMR 508.2.4).

5.2 Special Use and Occupancy

5.2.1 Stages

- 5.2.1.1 The existing building contains a stage as defined by 780 Section CMR 202. It is presumed that this special use met code at the time of original construction and has been continually maintained since that time.
- 5.2.1.2 The level of protection provided for the stage is required to be maintained as part of the project. Based on the MEBC requirements and the proposed scope of work, new construction features for stages are not retroactively required for the building as part of the project. All new work that impacts any of the existing stage features is required to meet 780 CMR Section 4.10.3.1 for new construction.

5.3 Building Construction

5.3.1 Construction Type

- 5.3.1.1 The building is comprised of brick masonry exterior walls with a mix of wood and non-combustible interior structural components, consistent with Type IIIB construction (780 CMR 601). The construction type of the building is required to be maintained as part of the project.

5.3.2 Structural Fire Resistance

- 5.3.2.1 Table 3 indicates the minimum fire-resistance ratings required for Type IIIB Construction. These ratings are required to be maintained for new and altered building components (MEBC 701.2).

Fire Resistance Rating of Building Elements	
Building Element	Fire Resistance Rating
Primary structural frame	0
Exterior bearing walls	2
Interior bearing walls	0
Nonbearing exterior walls	See Section 5.3.4
Nonbearing Interior walls	0
Floor construction and secondary members	0
Roof construction and secondary members	0

TABLE 3: FIRE-RESISTANCE RATINGS OF BUILDING ELEMENTS

- 5.3.2.2 Fire rated shafts, fire barriers, and horizontal assemblies are required to be supported by structure affording the required fire-resistance rating of the supported element (780 CMR 707.5.1 & 713.2).

5.3.3 Height and Area

5.3.3.1 The building is 3 stories above grade, with an approximate footprint and aggregate area of 13,000 sf and a total aggregate area of 39,000 sf.

5.3.3.2 As the project does not include a change of occupancy to a higher hazard ~~but does include an addition~~ ~~nor an addition~~, a height and area evaluation is ~~not~~ required to be completed (MEBC 1012.5 & 1102).

5.3.4 Nonbearing Exterior Walls Fire Resistance

5.3.4.1 Where the project includes a change of occupancy to Group A-3, Assembly, this is a change to a higher exterior wall hazard category (MEBC 1012.6), and as such, the existing exterior wall ratings and allowable percentage of openings are required to be evaluated as a function of the fire separation distance.

5.3.4.2 The required fire-resistance ratings and allowable opening percentages for all existing, new, and altered non-load bearing exterior walls are required to comply with the following based on building being fully sprinkler protected and unprotected openings (780 CMR 602 & 705.8):

Nonbearing Exterior Wall Ratings and Openings Based on Fire Separation Distance		
Fire Separation Distance	Fire-Resistance Rating	Allowable area
$0 \leq X < 3$	1 Hour	Not Permitted
$3 \leq X < 5$	1 Hour	Not Permitted
$5 \leq X < 10$	1 Hour	10%
$10 \leq X < 15$	1 Hour	15%
$15 \leq X < 20$	1 Hour	25%
$20 \leq X < 25$	1 Hour	45%
$25 \leq X < 30$	1 Hour	70%
$X \geq 30$	0 Hour	No Limit

TABLE 4: FIRE RESISTANCE RATING FOR NON-LOAD BEARING EXTERIOR WALLS

For the purposes of applying the above table, fire separation distance is measured to one of the following: (1) closest interior lot line, (2) centerline of a street, alley, or public way, or (3) an imaginary line between two buildings on the property.

The building has a fire-separation distance greater than 30 ft. in all directions, and as such, all existing and new exterior walls are permitted to be non-rated with unlimited unprotected openings.

5.4 Interior Walls and Partitions

5.4.1 Fire/Smoke Resistive Assemblies

5.4.1.1 If constructed new, or if existing areas are altered, the following spaces are required to be constructed of fire resistance rated construction:

Fire/Smoke Resistive Assemblies		
Type of Assembly	Construction	Code Reference
Corridors		
Serving all Other Occupancies	1-hour fire partition ²	780 CMR 1020.1
Occupancy Separations		
Non-separated mixed-uses. No separation is required unless otherwise noted below.		780 CMR 508.3
Special Rooms/Incidental Uses		
Nonsprinklered Electrical Room	2-hour fire barrier	NFPA 13, 8.15.10.3
Emergency Electrical Room	2-hour fire barrier	NFPA 70, 700.10(D)
Dry Type Transformer Room > 112.5 kVA	1-hour fire barrier	NFPA 70, 450.21(B)
Dry Type Transformer Room > 35,000 V	3-hour fire barrier	NFPA 70, 450.42
Boiler room where the largest piece of equipment is >15 psi and 10 horsepower	1-hour fire barrier ²	780 CMR 509
Furnace room where any equipment is >400,000 BTU per hour input	1-hour fire barrier ²	780 CMR 508.2.5
Shafts		
Connecting 3-stories or less	1-hour fire barrier	780 CMR 713.4

TABLE 5: FIRE/SMOKE RESISTIVE ASSEMBLIES

5.4.1.2 The structure supporting fire barriers, fire partitions, and horizontal assemblies are required to be protected to afford the required fire-resistance rating for the building element it supports.

5.4.2 Fire Doors

5.4.2.1 New fire doors and their corresponding components are required to have fire-resistance ratings and meet the required testing standards as specified in the table below. All doors and fire shutters required to be fire-resistance-rated must be designed, installed, and labeled in accordance with NFPA 80 (780 CMR 716.5):

5.4.2.2 All new fire doors and existing doors serving exit stairs are required to be self- or automatic closing and provided with an active latch bolt that will secure the door when it is closed (780 CMR 716.5.9.1; MEBC 805.4.3).

² Permitted to be non-rated where the building is fully sprinkler protected as part of the project (780 CMR 1020.1).

Door and Fire Shutter Requirements				
Wall Type	Required Wall Rating	Minimum Fire Door Rating	Performance Criteria for Doors/Shutters	Code Reference
Fire walls and barriers	2-hours	1½-hours	NFPA 252 or UL 10C / NFPA 252 or UL 10B	780 CMR 716.5
	1-hour	¾ - hours		
Fire barriers for 1-hr shafts	1-hour	1-hour		
Fire partitions	1-hour	¾-hour		
Fire partitions	1/2 -hour	1/3-hour		
Wall capable of resisting the passage of smoke	No rating	No rating	No air transfer openings, max 3/4" undercut	780 CMR 509.4.2

TABLE 6: OPENING PROTECTIVES

5.4.2.3 Doors located in corridor walls having a fire-resistance are also required to be listed as smoke and draft control doors in accordance with UL 1784 (780 CMR 716.2.2.1.1 & 3007.6.3).

5.4.3 Identification

5.4.3.1 All new fire barriers, fire partitions, or any other walls required to have protected openings or penetrations will be permanently identified with signs or stenciling (780 CMR 703.7). The identification will:

- Be located in accessible concealed floor, floor-ceiling, or attic spaces.
- Be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall or partition.
- Include lettering not less than 3 inches in height with a minimum 3/8-inch stroke in a contrasting color incorporating the suggested wording "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS".

5.5 Penetrations

5.5.1 Through & Membrane Penetrations

5.5.1.1 Penetrations of fire-resistance-rated walls and horizontal assemblies that are not protected with dampers or a shaft are required to comply with this section. Ducts and air transfer openings that are protected by dampers are required to comply with Section 5.5.2 of this report.

5.5.1.2 Through and membrane penetrations of fire-resistance-rated walls and fire-resistance-rated horizontal assemblies are required to be protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (780 CMR 714.3 & 714.4). Penetrations of fire-resistance-rated walls must have an F rating of not less than the required fire-

resistance rating of the wall penetrated (780 CMR 714.3.1). Penetrations of fire-resistance rated horizontal assemblies must have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated (780 CMR 714.4.1.2).

5.5.2 Ducts and Air Transfer Openings

- 5.5.2.1 Fire and smoke dampers are required where ducts and air transfer openings penetrate walls as specified in 780 CMR. Where dampers are installed, they must be listed and bear the label of an approved testing agency (780 CMR 717.3.1). Fire dampers must be tested in accordance with UL 555 and smoke dampers must be tested in accordance with UL 555S. Combination fire/smoke dampers must comply with both test standards.
- 5.5.2.2 Fire dampers are required to be rated for 1.5 hours, unless they are installed in a 3-hour or greater assembly, in which case they are required to be 3-hour rated (780 CMR 716.3.2.1). Smoke damper leakage ratings must be Class I or II. Elevated temperature ratings must not be less than 250°F (780 CMR 717.3.2.2). Combination fire/smoke dampers must comply with both rating requirements (780 CMR 717.3.2.3). Refer to 780 CMR 717.3.3 for required damper actuation methods.
- 5.5.2.3 Fire, smoke, and fire/smoke dampers are required to be provided with an approved means of access that permits inspection and maintenance of the damper and its operating parts (780 CMR 717.4). Access points are required to have permanent labels with letters that are not less than ½ inch in height that reads "FIRE/SMOKE DAMPER, SMOKE DAMPER, or FIRE DAMPER".

5.6 Vertical Openings

5.6.1 Existing Vertical Openings

- 5.6.1.1 The existing vertical openings in the building consist of the following:
- Stair shafts enclosed with substantial gypsum, concrete and/or substantial CMU wall construction. It is presumed that the existing fire-resistance rating of these enclosures is minimally 1-hour. Exit enclosure doors were observed to be non-rated and/or unlabeled, which is required to be addressed as part of the project.
 - MEP shafts connecting all floors of the building.
 - Two-story open stair connecting the Basement and the double height gymnasium.
- 5.6.1.2 All existing vertical openings are required to be minimally enclosed in 1-hour fire rated construction unless otherwise permitted by the MEBC and new construction requirements (MEBC 803.2.1(5.2 & 13)). Several doors

within rated stair enclosures were non-rated and/or unlabeled. It should be confirmed that rated doors are provided within all exit enclosures in accordance with Table 6 of this report.

- 5.6.1.3 The open stair connecting the Basement to the double height gymnasium is not enclosed in rated construction on the Ground Floor. If the stairway is within the work area or there is a change of occupancy as a result of the project, the MEBC requires the stairway to be enclosed in a minimum of 1-hour rated construction with doors that are self-closing and latching (MEBC 803.2.1 & 1012.7.4).

5.6.2 New Vertical Openings

- 5.6.2.1 New shafts or vertical openings are required to comply with the code for new construction as outlined in Table 5 above.

5.7 Interior Finishes

5.7.1 Wall and Ceiling Finishes

- 5.7.1.1 In areas of the building undergoing a change of occupancy classification, the interior finish of walls and ceilings are required to comply with the code for new construction (MEBC 1012.3). Additionally, existing interior finishes in exits and corridors within the work area are required to comply with the code for new construction (MEBC 803.4). Existing finishes that do not comply are permitted to be treated with an approved fire-retardant coating (MEBC 803.4(1)).
- 5.7.1.2 Newly installed interior wall and ceiling finishes are required to be Class A, B, or C rated in accordance with the classifications of ASTM E 84 or UL 723 and as indicated per each occupancy and location in Table 7 and Table 8 (780 CMR 803.11).

Minimum Interior Wall & Ceiling Finish Requirements Non-Sprinklered Buildings			
Occupancy Classification	Exit Enclosures	Corridors, Exit Access Stairways/Ramps	Rooms and Enclosed Spaces
A-3	A	A	C
B, E	A	B	C
S-2	B	B	C

TABLE 7: INTERIOR WALL & CEILING FINISH REQUIREMENTS

Minimum Interior Wall & Ceiling Finish Requirements Fully Sprinklered Buildings			
Occupancy Classification	Exit Enclosures	Corridors, Exit Access Stairways/Ramps	Rooms and Enclosed Spaces
A-3	B	B	C
B, E	B	C	C
S-2	C	C	C

TABLE 8: INTERIOR WALL & CEILING FINISH REQUIREMENTS

5.7.2 Interior Floor Finish

5.7.2.1 Existing floor finishes are permitted to remain.

5.7.2.2 New floor finishes and coverings are required to comply with the requirements of the DOC FF-1 "pill test". Additionally, the floor finishes in all spaces not separated from corridors by full height walls are also required to have a Class II minimum radium heat flux where the building is not protected throughout by an automatic sprinkler system (CPSC 16 CFR Part 1630) (780 CMR 804.4.1 & 804.4.2).

5.8 Fire Protection Systems

5.8.1 Automatic Sprinkler Systems

5.8.1.1 The existing building is not protected by an automatic sprinkler system.

5.8.1.2 A change of occupancy to Group A-3, Assembly would require an automatic sprinkler system to be provided where one of the following conditions exists (MEBC 1012.2.1; 780 CMR 903.2)

- The Group A-3 fire area exceeds 5,000 square feet;
- The Group A-3 fire area has an occupant load of 300 or more; or
- The Group A-3 fire area is located on a floor other than a level of exit discharge serving such occupancies.

5.8.1.3 If the work area includes a Group E, Educational occupancy, an automatic sprinkler system would be required to be provided where one of the following conditions exists (MEBC 1012.2.1; 780 CMR 903.2)

- The Group E fire area exceeds 12,000 square feet; or
- Throughout every portion of educational buildings below the level of exit discharge serving that portion of the building.

5.8.1.4 In addition to the requirements of the MEBC, Massachusetts General Law Ch. 148 Sec. 26G requires every building or structure, including major alterations thereto, which totals more than 7,500 gross square feet to be protected throughout with an automatic sprinkler system. The full text of the MGL is provided in Appendix A of this document.

- 5.8.1.5 Note that the 7,500 sf threshold includes “the sum total of the combined floor areas for all levels, basements, sub-basements, and additions, in aggregate, measured from the outside walls, irrespective of the existence of interior fire resistive walls, floors and ceilings”.
- 5.8.1.6 An advisory document published by the Sprinkler Appeals Board (attached at the end of this document) in 2009 expands upon the application of this MGL to existing buildings. An existing building is required to be protected with sprinklers where all of the following four conditions are satisfied:
1. Building gross square footage is more than 7,500 sf
 2. Sufficient water and water pressure exist to serve the system
 3. The nature of work to the building is considered as “major”, including any one or more of the following:
 - a. The demolition or reconstruction of existing ceilings or installation of suspended ceilings;
 - b. The removal and/or installation of sub flooring, not merely the installation or replacement of carpeting or finished flooring;
 - c. The demolition and/or reconstruction or repositioning or walls or stairways or doors; or
 - d. The removal or relocation of a significant portion of the building’s HVAC, plumbing, or electrical systems involving the penetration of walls, floors, or ceilings.
 4. The scope of work is proportional to the cost/benefit of sprinkler installation. To evaluate whether this is satisfied, the advisory document lists either of the following as thresholds for requiring sprinkler protection:
 - a. Work affects 33% or more of the total gross square footage; or
 - b. Total cost of the work (excluding cost to install a sprinkler system) is equal to or greater than 33% of the assessed value of the building, as of the date of permit application.
- 5.8.1.7 It is the conclusion of the advisory document that if the nature of the work described in item (3) meets at least one of the conditions in item (4) then it is reasonable to conclude that the alterations and modifications are considered as “major”, thus requiring sprinkler protection. However, ultimately it is the determination of the local code official to determine whether the renovation is considered as “major” or not.

Further evaluation of the scope of work is necessitated to determine if it collectively satisfies the above conditions and triggers requirement for a sprinkler system. Assume required

5.8.2 Fire Extinguishers

- 5.8.2.1 Portable fire extinguishers are required in all occupancies within the building and are required to be selected and installed in accordance with NFPA 10 (780 CMR 906.1).
- 5.8.2.2 Fire extinguishers are required to be installed in the locations designated by 780 CMR Section 906.1.
- 5.8.2.3 Fire extinguishers are required to be placed such that the travel distance from any point in the building to an extinguisher does not exceed 75 feet (NFPA 10, 6.2.1.2.2).

5.9 Emergency Systems

5.9.1 Fire Alarm and Detection Systems

- 5.9.1.1 The existing building is protected by a fire alarm system consisting of notification appliances, partial smoke/heat detection, and manual pull stations provided at the entrances to exit stair enclosures. The level of protection is required to be maintained as part of the project (MEBC 803.1).
- 5.9.1.2 All new fire alarm devices and any modifications to the existing fire alarm system are required to meet new construction requirements of NFPA 72 (2013 Edition) and 527 CMR relative to their installation.
- 5.9.1.3 The fire alarm system is required to be equipped with emergency voice/alarm communication capabilities where the work area contains Group E Occupancies (MEBC 804.4.1.1; 780 CMR 907.2.3) unless the Group E Occupant load is less than 100 persons (780 CMR 907.2.3(2)).

5.9.2 Standby/Emergency Power Systems

- 5.9.2.1 An emergency power system is required to serve the following building features (780 CMR 2702.2):
 - Exit signage in accordance with 780 CMR Section 1013.5.3.
 - Means of egress illumination in accordance with 780 CMR Section 1008.3.
 - Automatic fire detection systems.
 - Smoke Alarms.
 - Fire alarm systems.

- 5.9.2.2 The emergency power system is required to be installed in accordance with 780 CMR, 527 CMR 12.00, NFPA 110, and NFPA 111. The source of emergency power is permitted to be provided by the on-site emergency generator or from battery backup.

5.10 Means of Egress

The existing building is currently served by five exits to grade from the Ground Floor. The Basement Level is served by 3 exit stairs and the Second Floor is served by 2 exit stairs, all of which discharge directly to the exterior.

The work area is required to comply with the applicable provisions of MEBC Section 805 and 780 CMR Chapter 10 where any of the following conditions occur:

- Architectural/MEP features in the work area are altered such that the existing means of egress serving the space is reconfigured.
- Existing means of egress components are cited as hazardous by the building official.

Alterations are required to be done in a manner that maintains the level of protection provided for the means of egress (MEBC 704.1). The applicable requirements from the MEBC and 780 CMR Chapter 10 relative to the means of egress configuration within the building are outlined below.

5.10.1 Occupant Load

- 5.10.1.1 The building is required to have adequate exit capacity to serve the calculated occupancy load (780 CMR 102.6.4(b); MEBC 1012.4.3).
- 5.10.1.2 The number of occupants is computed at the rate of one occupant per unit of area as prescribed in Table 9 (780 CMR 1004.1.2). The occupant load is permitted to be increased from the occupant load established for the given use where all other requirements of 780 CMR are met (780 CMR 1004.2).

Occupant Load Factors	
Function of Space	Occupant Load Factor (occ/ft²)
Assembly (Standing space)	5 net
Assembly (Seating – Chairs only)	7 net
Assembly (Tables & Chairs)	15 net
Classrooms/Training Areas	20 net
Business	100 gross
Support/MEP	300 gross

TABLE 9: OCCUPANT LOAD FACTORS

5.10.2 Egress Capacity

- 5.10.2.1 The required egress capacity for any means of egress component is based on the following capacity factors (780 CMR 1005.3.1):

Egress Width Factors (inches of width per person)		
Voice Alarm System?	Stairways	All Other Components
Not Provided	0.3 in/occ	0.2 in/occ

TABLE 10: EGRESS WIDTH FACTORS

- 5.10.2.2 The use of reduced egress width factors is permitted if the building is fully sprinkler protected and the fire alarm system is equipped with emergency voice/alarm communication capabilities (780 CMR 1005.3.1(1)).

5.10.3 Number of Exits

- 5.10.3.1 The number of exits required from every story is not permitted to be less than that specified in Table 11 (780 CMR 1006.3.1; MEBC 805.3):

Minimum Number of Exits Required	
Occupant Load	Number of Exits Required
1 - 500	2
501 - 1,000	3
> 1,000	4

TABLE 11: MINIMUM NUMBER OF EXITS REQUIRED

5.10.4 Exit Access

- 5.10.4.1 Two exits or exit access doorways are required to be provided from any space where one of the following conditions exists (780 CMR 1006.2.1):

- The occupant load exceeds the values specified in Table 12.

Spaces with One Exit or Exit Access Doorway	
Occupancy	Maximum Occupant Load
A, B, E	49
S	29

TABLE 12: SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

- The common path of egress travel exceeds the maximum limitations specified in Table 13.

Common Path of Egress Travel	
Occupancy	Maximum Common Path of Travel Distance
A, B, E	75 feet
S	100 feet

TABLE 13: COMMON PATH OF EGRESS TRAVEL

- 5.10.4.2 Where two exits or exit access doorways are required from any portion of the exit access, the exit doors or exit access doorways are required to be

placed a distance apart equal to not less than one-third of the length of the maximum overall diagonal dimension of the building or area served (780 CMR 1007.1.1(2)).

5.10.5 Travel Distance

- 5.10.5.1 Exit access travel distances are not permitted to exceed the values specified in Table 14 (780 CMR 1017.2).

Maximum Allowable Travel Distance	
Occupancy	Travel Distance
A, B, E	200 feet
S-2	300 feet

TABLE 14: MAXIMUM ALLOWABLE TRAVEL DISTANCE

5.10.6 Doors

- 5.10.6.1 New doors are required to be a minimum of 32 inches in clear width, and are not permitted to have a swinging door leaf greater than 48 inches in nominal width (780 CMR 1010.1.1).
- 5.10.6.2 Egress doors are required to be of the pivoted or side-swinging type (780 CMR 1010.1.2). Doors are required to swing in the direction of egress travel where serving an occupant load of 50 or more persons (780 CMR 1010.1.2.1).
- 5.10.6.3 Doors that serve more than 49 assembly occupants are required to have panic hardware if the doors latch or lock. It should be confirmed that all required exit doors serving assembly spaces that contain latching devices are equipped with approved panic hardware. This applies to both new and existing doors (MEBC 805.4.4 & 780 CMR 1010.1.10).
- 5.10.6.4 In the work area, all doors opening onto an exit stair are required to be self- or automatic-closing by listed closing devices (MEBC 805.4.3).

5.10.7 Corridors

- 5.10.7.1 The width of corridors is not permitted to be less than that specified in the table below or as determined using the egress factors in Table 10 based on the occupant load served (780 CMR 1020.2).

Occupancy	Minimum Width
Access to and utilization of MEP equipment	24 inches
With a required occupancy capacity < 50 people	36 inches
Any areas not listed above	44 inches

TABLE 15: MINIMUM CORRIDOR WIDTH

- 5.10.7.2 Corridors in non-sprinklered buildings are required to be fire-resistance rated in accordance with Table 5. Fire-resistance rated corridors are required to be continuous from the point of entry to an exit and must not be interrupted by intervening rooms (780 CMR 1020.6). Foyers, lobbies, or reception rooms constructed as required for corridors are not considered as intervening rooms.

Unless a sprinkler system is provided, new and existing corridor doors in the work area are required to be minimally constructed of 1-3/8" solid wood core and are not permitted to have any glass panels other than approved wired glass (MEBC 805.5.1).

5.10.8 Exit Signage

- 5.10.8.1 The existing building is provided throughout with exit signage powered by battery backup (780 CMR 102.6.4 & 1013).
- 5.10.8.2 Exit and exit access doors are required to be marked by approved exit signs readily visible from any direction of egress travel (780 CMR 1013.1). The path of egress travel to exits and within exits are required to be marked by readily visible exit signs to clearly indicate the direction of egress travel where the exit or path of travel is not immediately visible. Exit signs within corridors and exit passageways are required to be placed such that no point is more than 100 feet or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign. Exit signs are not required in the following locations:
- In rooms or areas that require only one exit or means of exit access.
 - Main exterior exit doors that are obviously and clearly identifiable as exits where approved by the building official.

5.10.9 Egress Illumination

- 5.10.9.1 The existing building is provided throughout with emergency lighting powered by battery backup (780 CMR 102.6.4 & 1008).
- 5.10.9.2 The means of egress, including the exit discharge, are required to be illuminated at all times the building served by the means of egress is occupied (780 CMR 1008.1). The illumination level is not permitted to be less than 1 footcandle at the walking surface (780 CMR 1008.2)
- 5.10.9.3 In the event of power supply failure, an emergency electrical system is required to automatically illuminate all of the following areas (780 CMR 1008.3):
- Aisles in rooms and spaces that require two or more means of egress.
 - Corridors.
 - Exterior egress components at other than the level of exit discharge until exit discharge is accomplished.

- Interior exit discharge elements.
- Exterior landings for exit discharge doorways.

5.10.9.4 The emergency power system is required to provide power for a duration of not less than 90 minutes and is required to consist of storage batteries, unit equipment, or an on-site generator (780 CMR 1008.3.4). The initial illumination is required to be an average of 1 footcandle and a minimum at any point of 0.1 footcandle measured along the path of egress at the floor level. Illumination levels are permitted to decline to 0.6 footcandle average and a minimum of 0.06 footcandle at the end of the emergency lighting time duration (780 CMR 1008.3.5).

5.11 Elevator

It is our understanding that the project may include the installation of an elevator hoistway to provide vertical access throughout the building. 524 CMR, *Board of Elevator Regulations* regulates the design and installation of elevators serving the building. **At least one elevator in the building is required to be served by at least one passenger elevator designed to accommodate the loading and transportation of an ambulance stretcher or gurney that is 24" wide by 84" long with 5" radius corners in the horizontal position** (524 CMR 17.40). This elevator is required to serve all landings of the building, or if the building is divided into banks, one car in each bank is required to be sized as a medical emergency elevator.

5.12 Accessibility

5.12.1 521 CMR Application

- 5.12.1.1 The requirements of 521 CMR are limited to buildings or portions thereof that are open to the public. Employee-only spaces are exempt from these requirements; however, employee-only spaces that are occasionally used by visitors are not.
- 5.12.1.2 All public portions of the building will be designed in accordance with the requirements of 521 CMR.
- 5.12.1.3 521 CMR Section 3.3 contains the following scoping requirements for projects in existing buildings. The costs referred to in the scoping requirements below are cumulative for all projects to the building within a rolling 36-month period:
1. If the work is less than \$100,000, then only the work being performed is required to comply with 521 CMR.
 2. If the work costs more than \$100,000 but is less than 30% of the full and fair cash value of the building then in addition to the working being performed, the following accessible features are also required to be provided in the building:
 - a. Accessible entrance

- b. Accessible toilet room
 - c. Accessible drinking fountain
 - d. Accessible public telephone
3. If the work, plus the cost of all work within the past 36-months, costs more than 30% of the full and fair cash value of the building, then all public portions of the building are subject to the requirements of 521 CMR. Full and fair cash value is defined as the assessed value of the property not including the land (521 CMR 5.38).

In general, the building is not currently provided with accessible elements including entrances, vertical access, toilet rooms, and drinking fountain.

- 5.12.1.4 Based on the Town of Hanover's assessment database, the 495 Hanover Street parcel has an assessed building value of \$3,511,400. The Massachusetts Department of Revenue has assigned Hanover a 2019 assessment ratio of 0.95. Thus, **30% of the full and fair cash value is \$3,511,400 x 0.3 / 0.95 = \$1,108,863.**
- 5.12.1.5 **521 CMR Chapter 3.3.2 requires the entire building (public spaces only) to comply with 521 CMR if the work performed in any 36-month period amounts to 30% or more of the full and fair cash value of the building.**
- 5.12.1.6 Note that 521 CMR permits projects to submit variance requests in order to receive a modification or substitution for the requirements of 521 CMR. A variance request must demonstrate that compliance with 521 CMR is "impracticable". Impracticable is defined as:
- *Compliance with 521 CMR would be technologically unfeasible; or*
 - *Compliance with 521 CMR would result in excessive and unreasonable costs without any substantial benefit to persons with disabilities.*
- 5.12.1.7 Another potential variance approach may be to seek 'time relief' for items that the owner may be able to address with additional time for planning (typically no longer than 3 years). A time relief variance is common for items that require additional planning/funds or flexibility around tenant leases. These variances require that the owner commit to a timeline and provide quarterly updates to the Board regarding design and construction schedules.

5.12.2 ADA Application

- 5.12.2.1 Although not enforced by any authority having jurisdiction on the project, the requirements of the 2010 Americans with Disabilities Act Accessibility Guidelines (ADA) are applicable and enforced through civil litigation only.

- 5.12.2.2 ADA requires that altered portions of an existing building be readily accessible to and usable by individuals with disabilities to the maximum extent feasible (ADAAG 36.402(a)(1)).
- 5.12.2.3 Alterations to primary function areas should be made such that the level of accessibility, including the path of travel to the space, is made accessible to the maximum extent feasible. When determining if the upgrade is feasible, the ADA requirements state that the upgrade to the path of travel is disproportionate to the project when the cost to perform the work exceeds 20% of the cost of the alteration to the primary function area (ADA 35.151(a)(4)). Primary function areas are not limited to public uses areas and may include lobbies, offices, meeting rooms, etc. In choosing which accessible elements to provide if the cost is disproportionate, priority should be given to those elements that will provide the greatest access, in the following order:
- An accessible entrance
 - An accessible route to the altered area
 - At least one accessible restroom for each sex or a single unisex restroom
 - Accessible drinking fountains
 - Accessible telephones

5.13 Plumbing Fixtures

5.13.1 Number of Fixtures

- 5.13.1.1 Plumbing fixtures are required to be provided for the building in accordance with the factors in 248 CMR Section 10.10. The number of fixtures required for the building is dependent on the use of the space. The different functional areas proposed throughout the building may include the following:
- Conference rooms, classrooms, and training areas: Fixtures are required to be provided in accordance with the “Assembly” factors outlined in Table 16 (248 CMR 10.10(18)(b)(iv)).
 - Business use: Fixtures are required to be provided in accordance with the “Employee” factors outlined in Table 16 (248 CMR 10.10(18)(b)(iv)).
- 5.13.1.2 The number of fixtures required for the building are required to be determined based on the factors found in 248 CMR 10.10(18):

	Toilets		Urinals	Lavatories Each Sex		Drinking Fountains	Bath/ Shower	Service Sink
	Female	Male		Female	Male			
General Assembly	1 per 50	1 per 100	50% substitution (permitted)	1 per 200		N/A	N/A	N/A
Employee	1 per 20	1 per 25	33% substitution (permitted)	1 per 40		N/A	N/A	1 Service Sink per floor

TABLE 16: REQUIRED PLUMBING FIXTURES

5.13.1.3 The population used to calculate the number of fixtures for the building is required to be established by the Authority Having Jurisdiction, which is typically based on the maximum number of occupants expected within the building at any given time (248 CMR 10.10(18)(a)(ii)). The number of fixtures is required to be rounded up to the next fixture should a fraction occur (248 CMR 10.10(18)(a)(ii)).

5.13.2 Fixture Arrangement

5.13.2.1 Employees are permitted to travel up or down one level to reach required fixtures provided they are within a 300-foot travel distance (248 CMR 10.10(18)(i)(ii)).

5.13.2.2 For the purposes of the minimum fixture requirements of 248 CMR, where 248 CMR Section 10.10 requires two or more toilet fixtures designated by gender, those facilities are permitted to be replaced with single-use gender-neutral toilet rooms in accordance with one of the two options (248 CMR 10.10(18)(r)):

- Every gender-designated toilet fixture is replaced with an equal number of single-use gender neutral toilet rooms (such that there are no gender-designated fixtures); or
- Where the code requires four or more toilet fixtures combined for males and females, gender-designed fixtures may be replaced by single-use gender-neutral toilet rooms in increments of two such that for every male-designated fixture replaced by a gender-neutral toilet room, a female-designated fixture must also be replaced by a gender-neutral toilet room, and vice-versa.

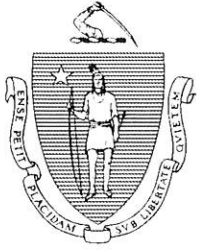
5.14 Energy

5.14.1 General Requirements

5.14.1.1 Alterations to the building are required to comply with 780 CMR Chapter 13, which is an amended version of the 2015 International Energy Conservation Code (IECC).

- 5.14.1.2 Alterations, renovations, or repairs to an existing building, building system, or portion thereof are required to conform to the provisions of the 780 CMR 13.00 as they relate to new construction, without requiring the unaltered portions of the existing building or building system to comply with the 780 CMR 13.00. Alterations, renovations or repairs are not permitted to create an unsafe or hazardous condition or overload existing building systems.

Appendix A: Massachusetts General Law Ch. 148 Sec. 26G



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MEMORANDUM

TO: Interested persons

FROM: Commonwealth of Massachusetts, Fire Safety Commission's Automatic Sprinkler Appeals Board

DATE: October 14, 2009

RE: Advisory regarding recent amendments to M.G.L. c. 148, s. 26G (Chapter 508 of the Acts of 2008) which requires enhanced sprinkler protection in certain buildings which total more than 7,500 gross square feet in floor area.

Introduction

Because of the unique characteristics of each building construction project, the Board realizes that it is not possible to address all aspects of this law in a single guidance document. As the Board hears appeals based upon the newly revised law, the Board anticipates that some of the conclusions found in this document may be subject to further review and possible modification. Accordingly, persons should closely monitor further guidance and decisions from the Board regarding this matter.

The Commonwealth of Massachusetts' Fire Safety Commission and the Automatic Sprinkler Appeal's Board (hereinafter referred to as "the Board"), has received several requests for guidance regarding the recent amendments to M.G.L. c.148, s.26G (Chapter 508 of the Acts and Resolves of 2008), which requires an adequate system of automatic sprinklers to be installed in certain buildings or structures totaling more than 7,500 square feet. Under s. 26G, this Board has jurisdiction to hear appeals from orders issued by heads of the fire department who are charged with enforcing the law. Under the authority of M.G.L. c. 30A, s. 8, the Board is issuing this advisory guidance document to assist heads of fire departments and building owners to understand the basic requirements of this law.

In developing this document, the Board has used its best efforts in developing guidance consistent with the language of the statute, legislative intent, related cases and common sense. This

document is not intended to be the final word on this matter or meant to be a substitute for a good faith, reasonable interpretation of the statute by the head of the fire department. In determining whether a building is subject to this law, the head of the fire department should make fair, consistent and well-reasoned determinations, based upon the reading of the law and the specific factors that exist for a particular building.

1. How did the law change?

The law changed in two significant ways. First, the law will now be applied uniformly throughout the state in all cities and towns. The provisions of M.G.L. c. 148, s. 26G, in various forms, have been law since 1982. However, until this recent amendment to M.G.L. c. 148, s. 26G (c. 508 of the Acts of 2008), the law only applied within those cities and towns that adopted the law by local option. However the law now applies to all municipalities on a statewide basis.

The second major change expanded the instances in which sprinkler systems will be required. The law limits the installation of sprinklers to new buildings and buildings subject to major alterations or additions if said buildings feature more than 7,500 gross square feet in floor area. Under the old law, the construction of an addition required sprinklers in the “addition only.” The new law requires sprinklers to be installed based upon the building’s sum total of square feet (s.f.) in floor area “in the aggregate.” As an example, under the new law, if you have an existing building that has 5,000 s.f. of floor area and you are constructing a 3,000 s.f. addition, you will now be required to install an adequate sprinkler system throughout the building, since the building will now total over 7,500 s.f. in the aggregate (8,000 s.f.).

2. Why was the law changed?

The legislative activity to amend the provisions of M.G.L. c. 148, s. 26G arose in the aftermath of a tragic commercial building fire, which occurred in Newton, Massachusetts in February, 2000, resulting in the death of five individuals. It was the Legislature’s intent to apply the law throughout the state. This reasoning is based upon the long-standing, fire safety principal that sprinklers save lives. Additionally, there was the desire to eliminate a perceived loophole, which existed in the old s. 26G. Under the old law, if you were only constructing an addition to a building without any major modifications to the existing building, a sprinkler system was required in the “addition only” if the addition itself contained over 7,500 s.f. in floor area. A building could have been added to by means of a series of smaller additions (7,500 s.f. or less) over the course of many years, resulting in the significant enlargement of the original building without the need to ever install sprinklers.

3. When does the law take effect?

The new law clearly applies to “the construction of buildings, structures or additions or major modifications thereto which total, in the aggregate, more than 7,500 gross square feet *permitted after January 1, 2010*”. (Sec. 6, c. 508 of the Acts of 2008). Therefore, if the date of the issuance of the permit is after January 1, 2010, the enhanced requirements will be applicable.

4. What type of buildings or structures are covered by the law?

The law, in general applies to “every building and structure...” and does not specify which particular use groups or building classifications are subject to the law. However the law does include several specific exemptions. The law does not apply to:

- Buildings or additions used for residential purposes;
- Rooms or areas of a telephone central office equipment building when such rooms or areas are protected with an automatic fire alarm system;
- Open-air parking structures, defined as: buildings, structures, or portions thereof, used for parking motor vehicles and having not less than twenty- five per cent of the total wall area open to atmosphere at each level, utilizing at least two sides of the structure; and
- Buildings used for certain agricultural purposes, as defined in M.G.L. c. 128 s. 1A.

Additionally, the statute contains some exceptions, if certain conditions or circumstances exist. They include:

- Buildings or structures, or certain areas of such buildings or structures, where the discharge of water would be an actual danger in the event of a fire, the head of the fire department shall permit the installation of such other fire suppressant systems as are prescribed by the state building code in lieu of automatic sprinklers; and
- No such sprinkler system shall be required unless sufficient water and water pressure exists.

It should also be noted that buildings owned by the Commonwealth are generally not subject to the provisions of s. 26G. In accordance with long standing case law and confirmed by a fairly recent Opinion of the Attorney General (No. 00/01-1), buildings owned by the state are not subject to the statutory requirements of laws such as s. 26G, unless there is express statutory language indicating that the state is subject to the law. However, buildings that are owned by state authorities or other similar entities created by the Legislature, may not necessarily be considered “state owned” and therefore exempt. In such situations, the particular statute creating the authority or entity should be reviewed by the head of the fire department with the assistance of the town attorney to determine if an exemption exists.

5. Does the law apply retroactively to all existing buildings, which are within the scope of the law?

No, the Legislature intended to give some protection to owners of existing or older buildings against the large expense of installing sprinklers by requiring the installation only upon some triggering event. The law is only triggered if: (1) a new building or structure is constructed or (2)

an addition is built onto an existing building or structure or (3) major alterations or modifications are planned for an existing building. Additionally, it should be noted that the building must total more than 7,500 gross s.f. in floor area, in the “aggregate” (existing building and addition). In short, if you are not constructing a new building, adding onto an existing building or undertaking major alterations to an existing building, or if the building does not total more than 7,500 gross s.f. in the aggregate, you are not required to install sprinklers under this particular law.

6. What method is used to determine if a building totals, in the aggregate, more than 7,500 gross square feet in floor area?

The statute specifically states that for the purposes of this law, “the gross square footage of a building or structure shall include the sum total of the combined floor areas for all floor levels, basements, sub-basements and additions, in the aggregate, measured from the outside walls, irrespective of the existence of interior fire resistive walls, floors and ceilings”. It should be noted that this calculation is unique and is somewhat different from the method used in the state building code, which in general, uses interior measurements to determine floor area.

7. Is a sprinkler system always necessary when there is an addition to a building, which is within the scope of the law?

It will depend upon how large the building will be after the addition is built. If an addition is being constructed to an existing building and the addition creates a building with a combined total of more than 7,500 s.f. “in the aggregate”, an adequate system of sprinklers will now be required throughout the building (addition and the existing building), without regard to the existence or extent of alterations, if any, to the previously existing building.

The legislative activity to amend the provisions of M.G.L. c. 148, s. 26G arose in the aftermath of a tragic commercial building fire, which occurred in Newton, Massachusetts in February 2000, resulting in the death of five individuals. The elimination of the limiting words “addition only,” in the old law and the requirement that the square footage determination be conducted “in the aggregate”, indicates the clear intent of the Legislature to require the enhanced sprinkler protection throughout the building when the building is added to and if the gross s.f. of the addition, combined with the existing building, totals more than 7,500 s.f. “in the aggregate.” If the building, including the new addition, totals less than 7,500. s.f., sprinklers are not required under the provisions of this law.

8. Is a sprinkler system always required if renovations are taking place in a building, which is within the scope of the law?

This depends upon whether the renovations are considered “*major*” alterations or modifications, as those terms are used in the statute. The Board realizes that the determination to install sprinklers, is often difficult and should be decided on a case-by-case basis, based upon the unique characteristics of the building and the nature and extent of the work. However, the Board suggests that such decisions be made in a predictable and consistent manner throughout the Commonwealth. Therefore, the Board suggests that fire officials, in deciding if “major alterations or modifications” are taking place, should be guided by the Massachusetts Appeals Court case

Congregation Beth Shalom & Community Center, Inc. v. Building Commissioner of Framingham et. Al., 27 Mass. App. Ct. 276 (1989).

In this case, the Court discussed the meaning of the terms “major alterations” as those words are used in M.G.L. c. 148, s. 26G. (It should be noted that those terms remain in the law, notwithstanding the amendments to s. 26G) The Court said that the terms “major alterations” shall include “any work, not repairs, which is “major” in scope or expenditure, and which results in changes affecting a substantial portion of the building”. In its decision, the Court looked at the nature of the planned work and would require sprinklers throughout the building if “the extra cost of installing sprinklers would be moderate in comparison to the total cost of the work contemplated...” or “if the physical work being done is of such scope that the additional effort to install sprinklers would be substantially less than would have been if the building were intact.”

At this time, it is the intent of the Board to consider the following factors established in the Congregation Beth Shalom case, to determine whether “major” alterations or modifications are taking place, thus requiring sprinklers to be installed throughout a building in accordance with M.G.L. c. 148, s. 26G.

A. What is the nature of the actual work?

- Is the planned physical work the type of work that would make the effort to install sprinklers substantially less than it would have been if the building were intact?
- Is the work merely minor repairs or cosmetic vs. major alterations?
Examples of “major” alterations or modifications, include, but may not be limited to:
 - The demolition or reconstruction of existing ceilings or installation of suspended ceilings;
 - The removal and/or installation of sub flooring, not merely the installation or replacement of carpeting or finished flooring;
 - The demolition and/or reconstruction or repositioning of walls or stairways or doorways; or
 - The removal or relocation of a significant portion of the building’s HVAC, plumbing or electrical systems involving the penetration of walls, floors, or ceilings.

B. What is the scope of the work or cost/ benefit of sprinkler installation?

This involves a review of the scope of the major alterations or modifications. Does it affect a substantial portion of the building? This requires a review to determine how much of the building is being affected by the work; **or** a determination that the cost of installing sprinklers is moderate in comparison to the total cost of the work.

To assist fire officials, building owners and construction project managers in making decisions, the Board has established the following two presumptions that may be used to determine if the scope or the cost of the planned alterations or modifications are “major” thus requiring sprinklers to be installed throughout a building.

- 1) Major alterations or modifications are reasonably considered major in scope when such work affects thirty-three (33) % or more of the “total gross square footage” of the building, calculated in accordance with section 26G.
- 2) Major alterations or modifications are reasonably considered major in scope or expenditure, when the total cost of the work (excluding costs relating to sprinkler installation) is equal to or greater than thirty-three (33) % of the assessed value of the subject building, as of the date of permit application.

It is the conclusion of the Board, at this time, that if the nature of the work is the type of work described in A **and** also meets at least one of the two presumptions described in B above, then it can be reasonable to conclude that the alterations or modifications are “Major”, thus requiring sprinklers throughout the building.

The Board is aware that buildings and circumstances vary from one project to another and that it would be unreasonable to expect that a single set of criteria could reasonably apply to all situations. Therefore, this list of described factors is not necessarily all-inclusive, but is meant to provide a common sense guideline for fire departments and building owners to determine if a sprinkler system is probably required under the provisions of this particular law.

9. What if the work is not “major” in scope for this particular permitted project, but appears to be part of a long-range plan?

If the specific permitted alterations or modifications are not considered “major,” as described, but appear to be one phase of a series of modifications being conducted over a reasonably short period (i.e. 5 years or less), it may be reasonable to conclude that such work could be part of a long range project resulting in “major alterations” to the entire building, or a substantial portion of it, thus triggering the sprinkler requirements. Although this occurrence may be rare, fire officials should be aware of future and past recent projects to determine if there is a series of planned projects that, taken together, may be considered “major” alterations or modifications, which would trigger the sprinkler requirements.

10. The statute states that “no such sprinkler system shall be required unless sufficient water and water pressure exists”. How is it determined if there is a lack of sufficient water and water pressure?

This language, creating an apparent exemption for situations involving lack of sufficient water and water pressure, has remained unchanged in the new amendments. In determining cases in which this issue has been raised, the Board has been guided by the Massachusetts Appeals Court case of *Chief of the Fire Department of Worcester v. John Wibley, et al.* 24 Mass. App. Ct. 912 (1987).

In that case the court concluded that:

“The term “sufficient water and water pressure exists” means that the owner of a building or addition to which the statute applies must have access to a source of water sufficient to operate an adequate system of sprinklers, or the exemption applies. The source may be either on the land on which the new building or addition is constructed or off the land, provided that it is legally available to the owner of the building or addition.”

In the Wibley case, the court, in agreeing with the fire chief, concluded that sufficient water and water pressure existed, notwithstanding the fact that the source of water was not on the owner’s land, but was legally available by means of a connection requiring the excavation to a legally available water main located 500 yards away.

11. Who has the responsibility to enforce the sprinkler installation requirements of this new law?

Under both the old and new version of M.G.L. c. 148, s. 26G, the head of the fire department is given the statutory authority to enforce the law.

12. What action should be taken by the head of the fire department at this time?

It is recommended that the head of fire department coordinate with the local building official and confirm that the building official is aware of the new law, its applicability and the statute’s unique method of determining a building’s total floor area. Additionally, it is suggested that procedures be established to assure that the building official communicate to the appropriate fire department personnel the existence of construction activities to buildings in excess of 7,500 s.f., which may be subject to the provisions of M.G.L. c. 148, s.26G. Once the head of the fire department determines that a planned building construction project is subject to s. 26G, the building owner/construction manager should be informed of the determination and the reasons for it by a written notice signed by the head of the fire department. The notice should also contain the information about the ability to appeal such determination to the Commonwealth’s Automatic Sprinkler Appeals Board within 45 days of the receipt of such notice.

13. How are appeals filed with the Board?

The law allows for any person aggrieved by an interpretation, order, requirement or direction of the head of the fire department, (or the failure to so act) to file an appeal with the Automatic Sprinkler Appeals Board. Such appeals must be filed **within 45 days** after receiving service of notice of the head of the fire department’s determination. The Board has a formal application form that must be completed by the person seeking the appeal. In addition to the application form, a detailed statement of the basis for the appeal, a copy of the chief’s determination and an appeal application fee (\$100.00) must accompany each application. Automatic Sprinkler Appeals Board application forms may be obtained by calling: 978-567-3181 or on the web at www.mass.gov/dfs (right side of the page Mass. Automatic Sprinkler Appeals Board).

14. What are the Board hearings like?

Members of the Commonwealth's Fire Safety Commission hold hearings of the Automatic Sprinkler Appeals Board. The hearings are informal and the strict rules of evidence used in a court of law are not used. The hearings require the presence of the appellant and the head of the fire department or their agent or attorney. The parties should be fully prepared to present their positions at the hearing. All plans, drawings, photographs expert findings/analysis or any other documents, information and testimony and arguments should be presented at the hearing to assist the Board in making its findings and determination.