

CHAPTER 34 NARRATIVE

FRAMINGHAM FULLER SCHOOL
FRAMINGHAM, MA

Prepared For:



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DOCUMENT HISTORY

Chapter 34 Design Narrative..... November 1, 2017

This document – Chapter 34 Design Narrative is intended for use by the design team to understand the code requirements if the existing Framingham Fuller School were to be renovated. This document contains the code basis for the building design, functionality of the egress system, fire protection recommendations, and a comprehensive code outline.

This document is a preliminary draft based on the existing building plans sent from Johnathan Levi Architects on November 1, 2017.

PURPOSE

The purpose of this report is to outline the requirements from Chapter 34 of the Massachusetts State Building Code for the Framingham Fuller School. This report will explain the required upgrades for each level of renovation on the existing school.

APPLICABLE CODES AND REQUIREMENTS

The following codes are presently adopted in the State of Massachusetts:

- **Building** Massachusetts State Building Code (MSBC), 9th Edition, which is an amended version of the 2015 International Building Code and the 2015 International Existing Building Code (IEBC).
- **Accessibility** Massachusetts Architectural Access Board (MAAB), 521-CMR.
2010 ADA Standards for Accessible Design
- **Electrical** Massachusetts Electrical Code, 527-CMR, 12.00. The Massachusetts Electrical Code is an amended version of the 2017 National Electrical Code (NFPA 70).
- **Elevators** Massachusetts Elevator Regulations, 524-CMR.
- **Energy** 2015 Edition of the International Energy Conservation Code (IECC) as amended by the State of Massachusetts
- **Fire Prevention** 527 CMR Massachusetts Fire Prevention Code, NFPA 1, 2012 Edition
- **Mechanical** International Mechanical Code, 2015, as adopted and amended by the MSBC (Chapter 28).
- **Plumbing** Massachusetts Fuel Gas and Plumbing Codes, 248-CMR.
- **Other** National Fire Protection Association (NFPA) Standards, as referenced by the MSBC and the MFPR.

PROJECT DESCRIPTION

Howe Engineers has prepared this report to document and provide the code compliance requirements for the existing Framingham Fuller School. The existing school is a one (1) story building with an approximate footprint area of 196,000 square feet. The school contains a basement that contains a boiler room and mechanical equipment. The main level of the school contains a gymnasium, classrooms, the library, cafeteria, auditorium, and the administrative offices. This narrative addresses requirements contained in the 9th edition of the 780 CMR, The Massachusetts State Building Code (MSBC).

GENERAL OPERATING ASSUMPTIONS

The following general operating assumptions serve as the basis for the Life Safety and Fire Protection design and should be incorporated into the new facilities operations plan. It is the responsibility of the Owner/Operator to ensure that these assumptions are enforced:

- Storage is restricted to 12 feet in height or less except where specifically designed fire sprinkler systems are provided.
- The materials used shall meet the interior finish requirements of the International Building, and NFPA 1.

CHAPTER 34 SCOPING REQUIREMENTS

COMPLIANCE METHODS

Section 301.1 of Chapter 34 of the MSBC presents the various options available to evaluate the code requirements applicable to repair, alteration, change of occupancy, addition, or relocation projects to existing buildings. Users elect one of the available compliance methods to evaluate the existing building based on the proposed scope of work of the project. The three compliance options available are as follows:

a. Prescriptive Compliance Method:

Users electing to use this compliance method should follow the requirements outlined in Section 4 of Chapter 34 to perform the existing building evaluation. This section has vague requirements that would require multiple complex discussions with local officials. Although, Howe Engineers anticipates that some issues will be required to be discussed, it is our opinion that this option leaves to much discretion to the building official and does not provide enough guidance.

b. Work Area Compliance Method:

Users electing to use this compliance method should follow the requirements of Sections 5 through 13 of the MSBC Chapter 34 to perform the existing building evaluation.

c. Performance Compliance Method:

Users electing to use this compliance method should follow the requirements of Section 14 of Chapter 34 of the MSBC to perform the existing building evaluation. This method generally requires more upgrades than the work area method would require and thus has not been chosen.

The work area compliance method has been selected for use on this project based on the clear requirements and the ability to limit upgrades largely to the work area.

GENERAL MASSACHUSETTS AMENDED REQUIREMENTS (780 CMR 34.00)

Section 101.4.5 Fire Prevention:

This section states all references to the International Fire Code (IFC) shall be considered reference to 527 CMR: Board of Fire Prevention Regulations. This stipulates that the requirements of the Massachusetts General Laws Chapter 148 Section 26G may apply with respect to automatic sprinkler system requirements. In general, this section of the Massachusetts General Laws requires sprinkler protection to be provided in occupancies where the altered area exceeds 7,500 square feet.

If more than 7,500 square feet of the building were to be renovated, the entire school would need to be supplied with a sprinkler system.

Section 102.6.4 Existing Means of Egress, Lighting and Ventilation

These special provisions address means of egress in all buildings and are designed to ensure a minimum acceptable level is maintained. The specifics of these provisions must be satisfied regardless of any project work. The requirements are enforced at the discretion of the approving authorities. The specifics of these requirements are as follows:

- a. The number of means of egress serving every space and/or story as required by Chapter 10 of the MSBC. Table 1006.3.1 requires that the following number of exits be provided per floor based on the occupant load:

Table 1

Occupant Load Per Story	Minimum Number of Exits or Access to Exits from Story
1-500	2
501-1000	3
More than 1000	4

Refer to the occupant load and egress analysis tables below. A sufficient number of means of egress is provided from the building in accordance with the table above.

- b. The capacity of means of egress provided from each story and space must satisfy the criteria of Section 1005.1 of the MSBC.

Section 1005.1 provides requirements for the proper sizing of egress components. Components are given a capacity factor that determines, based on their size, what occupant load they are individually capable of handling. So long as the capacity is in excess of the occupant load, the means of egress are in compliance with the code. The total width of means of egress should not be less than the total occupant load served by the means of egress multiplied by 0.30 inches per occupant for stairways and by 0.20 inches per occupant for other egress components. If the building were to be sprinklered, the egress capacities would decrease to 0.15 inches per occupant for doors, and .2 inches per occupant for stairs.

The following tables show the occupant load and the capacity for the building:

Space	Size (sq. ft.)	Loading Factor (sq. ft. per occupant)	Occupancy
Assembly (unconcentrated)	10,953	15	732
Auditorium	4,258	7	609
Business / Offices	13,843	100	150
Classrooms	46,230	20	2339
Kitchen	3,357	200	17
Lab Classrooms	24,201	50	495
Library	3,237	100	33
Locker Rooms	22,652	50	455
Stage	2,128	15	143
Storage	18,572	300	89
Total			5,062

Area	Exit Description	Clear Width of Limiting Component (in)	Capacity Factor (in/occ.)	Exit Capacity (people)
Egress Serving First Floor	Door 1	127	0.2	635
	Door 2	63	0.2	315
	Door 3	63	0.2	315
	Door 4	31.5	0.2	158
	Door 5	63	0.2	315
	Door 6	63	0.2	315
	Door 7	31.5	0.2	158
	Door 8	31.5	0.2	158
	Door 9	63	0.2	315
	Door 10	63	0.2	315
	Door 11	63	0.2	315
	Door 12	62	0.2	310
	Door 13	63	0.2	315
	Door 14	63	0.2	315
	Door 15	63	0.2	315
	Door 16	64	0.2	320
	Door 17	55.5	0.2	278
Total				5,167

As shown in the tables above, the egress capacity exceeds the occupant load calculated within the space and is compliant with the requirements of the building code for egress capacity.

- c. Any means of egress which is not so arranged as to provide safe and adequate means of egress, including exit signage and emergency lighting in accordance with Chapter 10 of the MSBC.

Adequate emergency signage will need to be provided as part of the school renovation. Currently the school emergency lighting is provided by battery backup. An emergency power backup system is not currently provided to the building. Adequate ventilation should be confirmed by the mechanical engineer.

EXISTING BUILDING EVALUATION – MSBC WORK AREA METHOD

GENERAL

A MSBC Chapter 34 evaluation of the existing building is required to determine the required fire protection and life safety improvements when any alteration or renovation work is undertaken.

Each of the following classes of work has an associated chapter within the MSBC Chapter 34 which outlines the provisions for that type of work on an existing building.

Repairs:

Repairs are defined as “the reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage”. These include the restoration of materials, elements, equipment or fixtures for the purpose of maintaining a good or sound condition.

Alteration Level 1:

Alterations are defined as “any construction or renovation to an existing structure other than repair or addition.” Level 1 alterations include, “removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.”

Alteration Level 2:

A Level 2 alteration consists of the reconfiguration of space, addition or subtraction of a door or window, the reconfiguration of any system, or adding any equipment to the building. Level 2 alterations should also comply with the provisions for a Level 1 alteration.

Alteration Level 3:

A Level 3 alteration consists of the reconfiguration of more than 50% of the building area. Level 3 alterations should also comply with the provisions for a Level 1 and 2 alterations.

Additions:

Additions are any extension to a building which increases the floor area, number of stories, or height of the building.

Change In Use:

Portions of buildings where a change in purpose or level of activity occurs which involves a change in the application of the requirements of the applicable codes.

This report will outline the requirements for each level of renovation.

REQUIREMENTS FOR REPAIRS & ALTERATIONS – LEVEL 1, 2 & 3-

Alteration Level 1

A Level 2 or 3 alteration is anticipated, which requires that the provisions of Level 1 also be complied with.

Interior Finish:

All newly installed interior finishes should comply with the flame spread requirements of the MSBC Chapter 8 (MSBC Ch.34 702.1). New carpeting used as an interior floor finish material should comply with the radiant flux requirements of Section 804 of the MSBC (MSBC Ch.34 702.2).

All new interior finishes must comply with the requirements of the MSBC. As per MSBC Table 803.11, the following interior finish ratings are required at a minimum:

Sprinklered Educational

- **Exit Enclosures and Exit Passageways: Class A or B**
- **Corridors: Class A, B, or C**
- **Rooms and Enclosed Spaces: Class A, B, or C**

Non-Sprinklered Educational

- **Exit Enclosures and Exit Passageways: Class A**
- **Corridors: Class A or B**
- **Rooms and Enclosed Spaces: Class A, B, or C**

Classification of interior finishes will be provided in accordance with ASTM E 84 / UL 723.

Alteration Level 2

MSBC Ch.34 801.2 of Level 2 alterations requires that alterations categorized as Level 2 comply both with the requirements of Chapter 7, Alterations Level 1, and Chapter 8, Alterations Level 2.

Fire Protection Systems:

Section 804.2.2 requires that a sprinkler system be installed if the work area is greater than 50 percent of the floor area. Additionally, as noted previously, according to the Massachusetts General Laws Chapter 148 Section 26G, if more than 7,500 square feet of the building is renovated, a sprinkler system will be required in the entire school.

Fire Alarm System:

The fire alarm system within the work areas will be required to be upgraded and should include new audio and visual devices. The fire alarm in the work area would need to be upgraded to provide voice communication. Where the work area is more than 50 percent of the floor area, the fire alarm throughout the

floor must be upgraded. From our survey it was seen that the current fire alarm system is non-addressable. Smoke detection may be permitted to be removed if the building is fully sprinklered.

Interior Finish:

Refer to the Level 1 Alterations interior finish section. In addition, where the *work area* on any floor exceeds 50 percent of the floor area, Section 803.4 should also apply to the interior finish in exits and corridors serving the *work area* throughout the floor.

Means of Egress - General:

The means of egress within work areas are required to comply with the following requirements of this section if the following conditions exist: (MSBC Ch.34 805.2).

Number of Means of Egress:

The minimum number of exits is required to be in accordance with Section 102.6.4 (see report section above).

Room A3A, and D30 will need to be provided a second means of egress.

Guards:

Guards are required to be provided for floors that are more than 30-inches above the floor or grade below that is currently not provided with guards or with guards that are in danger of collapsing (MSBC Ch.34 803.5 & 805.11).

Door Swing:

In the work area and in the egress path from the work area to the exit discharge, all egress doors serving an occupant load greater than 50 should swing in the direction of exit travel (MSBC Ch.34 805.4.2). Where the work area exceeds 50 percent of the floor area, all doors on the floor of the work area are required to swing in the direction of egress where serving an occupant load that is greater than 50 (MSBC Ch.34 805.4.2).

All doors in the work area serving an occupant load greater than 50 will need to swing in the direction of travel.

Door Closing:

In any work area, all doors opening onto an exit passageway at grade or an exit stair should be self-closing or automatically closing by listed closing devices. This requirement applies unless the exit enclosure is not required by the MSBC or if the means of egress are not within the work area (MSBC Ch.34 805.4.3).

As the MSBC requires the corridors in an un-sprinklered educational building to be one (1) hour rated, all doors leading to the corridor must be self-closing. During the site survey it was noted that the classroom

doors are not self-closing. If the building is sprinklered throughout, the corridors are not required to be rated and in turn the doors leading the corridor are not required to be rated.

Dead Ends:

Dead-end corridors in any work area should not exceed 35-feet (MSBC Ch.34 805.6). **Based on our survey of the building, dead ends were observed in the main corridors where doors swinging in a single direction bisect the corridor. These doors could potentially be removed (if the building is fully sprinklered), or replaced with bi-swing doors to eliminate the dead ends.**

Openings in Corridor Walls:

MSBC Ch.34 805.5.3 requires such openings are sealed with materials consistent with the corridor construction.

If the building remains un-sprinklered, all openings in the corridor will need to be sealed. If the building is sprinklered, then the openings in the corridor will be allowed.

Means of Egress Lighting:

The means of egress lighting in all work areas should conform to the requirements of the MSBC for new construction. Where the work area on any floor exceeds 50 percent of that floor area, the entire floor is subject to the new construction requirements of the MSBC for means of egress lighting (MSBC Ch.34 805.7).

The means of egress lighting in the building will need to comply with new construction requirements in the MSBC.

Exit Signs:

The exit signs in all work areas should conform to the requirements of the MSBC for new construction. Where the work area on any floor exceeds 50 percent of that floor area, the entire floor is subject to the new construction requirements of the MSBC for exit signage (MSBC 34 805.8).

The exit signage in the building will need to comply with the requirements of the MSBC for new construction. During the site survey paper exit signs were noted and will need to removed and replaced with internally illuminated exit signage.

Accessibility:

The requirements of 521 CMR apply to the project. Refer to the Accessibility portion of this report.

Energy Conservation:

Level 2 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the International Energy Conservation Code. The alterations (e.g. new work) should conform to the energy requirements of the International Energy Conservation Code as they relate to new construction only.

Structural Requirements:

The structural requirements contained within the Alteration Level 1 and 2 requirements should be evaluated by the design team's structural engineer.

Alteration Level 3

If more than 50 percent of the entire floor area of the school is renovated then the renovations must comply with the requirements of Level 3 Alterations. MSBC Ch.34 901.2 of Level 3 alterations requires that alterations categorized as Level 3 comply both with the requirements of Chapter 7, Alterations Level 1, Chapter 8, Alterations Level 2, and Chapter 9, Alterations Level 3.

Existing Shafts and Openings

Existing stairways that are part of the means of egress must be enclosed in accordance with MSBC Ch. 34 903.1 from the highest work area floor to, and including, the level of exit discharge and all floors below.

Section 1016.1 of the MSBC will allow 50 percent of the stairwells to remain open provided that they do not connect more than 2 stories and the exit access travel distance is measured along the stairwell.

Interior finish:

Interior finish in exits serving the work area must comply with MSBC Ch.34 803.4 between the highest floor on which there is a work area to the floor of exit discharge.

Automatic Sprinkler Systems:

Section 904.1, and 804.2.2 require that a sprinkler system be installed if the work area is greater than 50 percent of the floor area. Additionally, as noted previously, according to the Massachusetts General Laws Chapter 148 Section 26G, if more than 7,500 square feet of the building is renovated, a sprinkler system will be required in the entire school.

Fire alarm and detection systems:

Fire alarm and detection systems complying with Sections 804.4.1 and 804.4.3 must be provided throughout the building in accordance with the MSBC for new construction.

The fire alarm in the entire school would need to be upgraded, this includes smoke detection, new visual and audio devices. The new fire alarm must provide voice communication. Smoke detection may be permitted to be removed if the building is fully sprinklered.

Means-of-egress lighting:

Means of egress from the highest work area floor to the floor of exit discharge must be provided with artificial lighting within the exit enclosure in accordance with the requirements of the MSBC for new construction.

Means of egress throughout the school will need to be provided per the requirements of the MSBC for new construction.

Exit signs:

Means of egress from the highest work area floor to the floor of exit discharge must be provided with exit signs in accordance with the requirements of the MSBC for new Construction.

Exit signs will need to be provided throughout the school per the requirements of the MSBC for new construction. During the site survey paper exit signs were noted and will need to be removed and replaced with internally illuminated exit signage.

Accessibility:

The requirements of 521 CMR apply to the project. Refer to the Accessibility portion of this report.

Structural Requirements:

The structural requirements contained within the Alteration Level 1, 2, and 3 requirements should be evaluated by the design team's structural engineer.

Energy Conservation:

Level 3 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the International Energy Conservation Code. The alterations must conform to the energy requirements of the International Energy Conservation Code as they relate to new construction only.

ADDITION

General

An *addition* to a building or structure should comply with the *MSBC* as adopted for new construction without requiring the *existing building* or structure to comply with any requirements of those codes or of these provisions, except as required by this chapter. Where an *addition* impacts the *existing building* or structure, that portion should comply with the *IEBC*.

An addition should not create or extend any nonconformity in the *existing building* to which the *addition* is being made with regard to accessibility, structural strength, fire safety, means of egress, or the capacity of mechanical, plumbing, or electrical systems.

Other Work

Any *repair* or *alteration* work within an *existing building* to which an *addition* is being made should comply with the applicable requirements for the work as classified in Chapter 5 (*MSBC* Ch.34 1101.3).

Height and Area Evaluation

No *addition* shall increase the height of an *existing building* beyond that permitted under the applicable provisions of Chapter 5 of the *MSBC* for new buildings. No *addition* should increase the area of an *existing building* beyond that permitted under the applicable provisions of Chapter 5 of the *International Building Code* for new buildings unless fire separation as required by the *MSBC* is provided.

From the site survey conducted on October, 19 2017, it was found that the building is constructed out of Type IIB Unprotected, Noncombustible Construction. This is because the building is constructed out of concrete and unprotected steel, which was observed throughout the building. According to Table 504.4 and 506.2 of the MSBC, a Type IIB Educational Building can be constructed up to two (2) stories with an area of 14,500 square feet. The area is increased by 75 percent as the school is provided with 100 percent open perimeter. This means that the school can be constructed up to 2 stories in height with an area of 25,375. If the school is sprinklered the allowable height is increased by one story and the area is increased by an additional 200 percent. This means that if the school were to be sprinklered it would be allowed to have a height of 3 stories and an area of 54,375 square feet.

Since the existing building is already larger than what is allowed for new construction (196,000 square feet), an addition cannot be made to the existing school unless the construction type of the existing school is upgraded, the addition is limited to a single story and the requirements for the Unlimited Area Provisions are met, or the addition is separated from the school with a fire wall creating a separate building. If the entire building except the auditorium were demolished than the structural steel in the auditorium could be required to be protected if it was desired for the building to be of Type I construction.

ACCESSIBILITY

For each Level of Alteration defined above, The Massachusetts Architectural Access Board (MAAB) separately governs accessibility requirements. The MAAB requirements are only applicable to public spaces in a building. In the Framingham Fuller School most spaces appeared to be accessible to the public (e.g. students can visit them including professor's offices) and thus MAAB is applicable. MAAB is not applicable to employee only areas.

MAAB application criteria for existing buildings are identified in MAAB Section 3.3. There are three (3) thresholds used to determine the extent of compliance required with MAAB provisions. These thresholds are determined over a rolling 36 month period and are as follows:

1. If the work being performed costs less than \$100,000, then only the work being performed must comply with MAAB.

Exception: General maintenance and on-going upkeep of existing, underground transit facilities will not trigger the requirement for an *accessible entrance* and toilet unless the cost of the work exceeds \$500,000 or unless work is being performed on the *entrance* or toilet.

2. If the work being performed costs more than \$100,000 but less than 30% of the full and fair cash value of the building, then the work being performed must comply with MAAB and the following features must be provided:
 - a. An accessible public entrance;
 - b. A public accessible toilet room;
 - c. An accessible telephone; and
 - d. An accessible drinking fountain.

Exception: Whether performed alone or in combination with each other, the following types of *alterations* are not subject to **521 CMR 3.3.1**, unless the cost of the work exceeds \$500,000 or unless work is being performed on the entrance or toilet. (When performing exempted work, a memo stating the exempted work and its costs must be filed with the permit application or a separate building permit must be obtained.)

3. If the work being performed costs more than 30% of the full and fair cash value of the building, then the entire building must be made to comply with MAAB. Work performed that is limited solely to electrical, mechanical, or plumbing systems and that does not involve the alteration of any elements or spaces required to be accessible by MAAB, and has a total value of less than \$500,000 are excluded from this threshold review [MAAB 3.3.2 (b)]. However, if any non-exempt work is permitted within the 3 year period, all exempt work must be included.

When determining the appropriate Level of work as described above, the cost of the work to be used in the calculation for item 3 is all permitted work over a 3 year period.

ADAAG REQUIREMENTS

ADAAG is applicable to all public and private places of work. ADAAG does not requires upgrades be made for alteration work that is limited to work similar to re-roofing, maintenance, mechanical systems etc. Further, alterations include, but are not limited to, remodeling, renovation, rehabilitation, reconstruction, historic restoration, changes or rearrangement in structural parts or elements, and changes or rearrangement in the plan configuration of walls and full-height partitions. Normal maintenance, reroofing, painting or wallpapering, asbestos removal, or changes to mechanical and electrical systems are not alterations unless they affect the usability of the building or facility.

This is different than MAAB, which does “count” this work. However, any work that does affect the primary function of the building should be made to be compliant. In addition, up to 20% of the project cost may be spent on accessibility upgrades before it is considered disproportionate.

Costs that may be counted as expenditures required to provide an accessible path of travel may include:

1. Costs associated with providing an accessible entrance and an accessible route to the altered area, for example, the cost of widening doorways or installing ramps;
2. Costs associated with making restrooms accessible, such as installing grab bars, enlarging toilet stalls, insulating pipes, or installing accessible faucet controls;
3. Costs associated with providing accessible telephones, such as relocating the telephone to an accessible height, installing amplification devices, or installing a text telephone (TTY); and
4. Costs associated with relocating an inaccessible drinking fountain

In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, in the following order

1. An accessible entrance;
2. An accessible route to the altered area;
3. At least one accessible restroom for each sex or a single unisex restroom;
4. Accessible telephones;
5. Accessible drinking fountains; and
6. When possible, additional accessible elements such as parking, storage, and alarms

It is assumed that the renovation of the school will trigger full compliance with MAAB given that the cost of the project will be more than 30% of the assessed value of the building. Given this, the following items would be required to be accessible.

The following accessibility features should be provided in the building:

- All bathrooms must be accessible.
- All entrances and grade exit doors must be accessible
- All doors and doorways must be accessible
- Accessible seating must be provided in the auditorium and gym.

- Sinks and counters in classrooms must be accessible
- 5% of the lockers in each locker room must be accessible
- 5% of all lockers in the school corridors must be accessible
- 5% of all showers, but not less than one in each locker room must be accessible
- The kitchen including any transaction desks must be accessible
- 5%, but not less than one of each type of Science Laboratory space must be accessible
- Accessible parking must be provided
- All exterior pathways must be accessible
- All Classrooms must be accessible
- Assembly areas should be accessible and provide assisted listening devices

During the survey conducted on October 19 2017, the following accessibility deficiencies were found in the school:

- In general, approximately 90 percent of the doors in the school do not provide 32 inches of clear width and in turn are not accessible. This includes office, classroom, and entrance doors.
- In general, approximately 90 percent of the doors in the school are provided with door knobs instead of accessible hardware and in turn are not accessible.
- The auditorium is not accessible:
 - Accessible Seating (Wheelchair spaces, and Armless seats) are currently not provided in accordance with 521 CMR 14.2 (MAAB).
 - A route from the seating locations to the stage/performing area is provided (stairs) but an associated accessible route is not provided (ramp or lift). 521 CMR 14.6 (MAAB) requires that where access is provided to the stage from within the place of assembly, an accessible route that is within the place of assembly from the wheelchair seating location must be provided to the stage.
 - A landing at the top of the auditorium aisle is not provided prior to the exit access doors.
 - Handrails are not provided in the slopped aisles in accordance with 521 CMR 24.5 (MAAB).
 - The control booth within the auditorium is not accessible due to a sloped floor and large lip at the entrance.
 - The ramped aisles in the Auditorium exceed the maximum rise of 30 inches for any run, and appropriate landings are not provided in accordance with 521 CMR 24.2.2 (MAAB).
- The depressed performing room (C13) is not accessible
 - Accessible route not provided
 - Handrails are not provided on both sides of the stairs.
- The depressed performing room (C20) is not accessible
 - Accessible route not provided
 - Handrails are not provided on both sides of the ramp.
 - Handrail extensions are not provided.
 - Handrails are not provided on either side of the stairs.

- Doors into classrooms and offices off of the main corridors do not provide at least 18 inches of pull clearance and 12 inches of push clearance (push clearance not required if door does not have a closer). This configuration is typically seen where built in closets are present adjacent to the doorway.
- No fully accessible bathrooms are present in the facility, for either students or faculty. Some of the individual unisex bathrooms have appropriate clearances and could be altered to be accessible. However, most of the student bathrooms would require reconfiguration of the space.
- Integrated (not separate) accessible seating in the gymnasium needs to be confirmed.
- In general drinking fountains were observed to not be accessible.
- An accessible shower in the boy's, or girl's locker room is not provided.
- 5% of Lockers in the boy's or girl's locker room are not accessible.
- Bathroom in the boy's or girl's locker room are not accessible.
- Pull stations are mounted at 54 inches, they should be mounted no higher than 48 inches.
- In general there are no accessible laboratory benches, or sinks in the lab classrooms.

AUDITORIUM

There may be a desire for the auditorium to remain while demolishing other portions of the facility. Based on preliminary discussions with MAAB there may be opportunities to pursue variances for some of the items noted in the accessibility section of this report. However, it is Howe Engineers opinion that significant upgrades would need to be made to the auditorium in conjunction with the approval of these variances. This would include providing, at a minimum of one accessible route from the auditorium entrance to the first row of seating. Providing accessible seating, and an accessible route that is within the place of assembly from the wheelchair seating location provided to the stage. Further discussion would be required with MAAB to provide a finalized approach to allowing the existing auditorium to remain with modifications.

PLUMBING FIXTURES

The following tables contain the required number of plumbing fixtures for the planned occupant load within the school. A table is also provided showing the available capacity from the provided plumbing fixtures. The existing fixture counts are based on the information gathered on the October 19, 2017 site survey. The total occupant load presented in these table is based on the program load of the school. Using this program load would require approval from the plumbing official.

Occupancy	Subcategory	Water closets			Lavatories		Drinking Fountains
		Male	Female	Urinals	Male	Female	
Educational	Secondary	1 per 90	1 per 30	1 per 90	1 per 90	1 per 90	1 per 75
Staff	Staff	1 per 25	1 per 20	33%	1 per 40	1 per 40	

Existing Building

Area	Room	Water Closet	Water Closet Capacity	Urinal	Urinal Capacity	Lavatory	Lavatory Capacity	Capacity Provided Per Area
First Floor	Men	24	2,160	28	2,520	32	2,880	2,160 Men 720 Women
	Women	24	720	-	-	23	2,880	
Total		48	2,880	28	2,520	55	5,760	2,160 Men 720 Women

Planned Occupant Load

Occupancy	Subcategory	Total Occupant Load	Water closets			Lavatories		Drinking Fountains
			Male	Female	Urinals	Male	Female	
Students	Secondary	630	4	11	4	4	4	9
Staff	Educational	96	2	3	up to 33%	2	2	
TOTALS		726	6	14	Varies	6	6	9

Toilet Travel distance

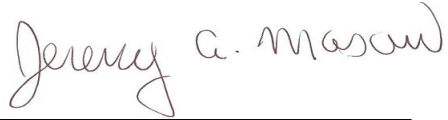
According to the Massachusetts Plumbing code the maximum allowable toilet travel distance from the most remote point is 300 feet. **Staff is allowed to travel up or down one story, but students are not permitted to travel up or down one story to access the facilities.**

CONCLUSION

The renovations to the Framingham Fuller School would be conducted in accordance with the requirements of the Massachusetts Building Code. The following items would be required in the school if it were to be renovated.

1. The school would need to be protected throughout with an automatic sprinkler system if the work area is greater than 7,500 square feet.
2. From our survey it was seen that the current fire alarm system is non-addressable, in turn, if a Level 2 or 3 Alteration is desired, the entire fire alarm must be upgraded to provide voice communication, and appropriate smoke detection, and audio/visual notification. Smoke Detection may not be required if the building becomes fully sprinklered.
3. If the renovation triggered full accessibility compliance, then
 - a. Approximately 90 percent of the doors would need to be altered to provide 32 inches of clear width and would require the door knob hardware to be replaced with an accessible latch,
 - b. All doors would need to be altered to provide an 18 inch pull clearance and a 12 inch push clearance,
 - c. All of the restrooms would need to be altered to be accessible,
 - d. Accessible sinks and counters in labs would be required to be provided,
 - e. Accessible entrances for the building would be required,
 - f. The Auditorium would need to be provided with accessible route to accessible seating, as well as the stage.
4. Egress should be provided as outlined in this report.

Please contact our office if you have any questions regarding the items addressed in this letter.
Prepared by,

A handwritten signature in cursive script that reads "Jeremy A. Mason". The signature is written in black ink and is positioned above a horizontal line.

Jeremy A. Mason, P.E

Project Director