

# 374 Somerville Ave.

## Somerville, Massachusetts



## Code Report

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## **Introduction**

The existing building, located at 374 Somerville Avenue in Somerville, Massachusetts occupied with retail space on the First Floor and office space on the Second Floor. The proposed scope of work is to retain the First Floor retail and office tenant spaces and convert the Second Floor and a new partial 3<sup>rd</sup> Floor to 5 residential units, including a small addition with units and covered parking at the rear of the building. This code summary is based on architectural drawings dated June 23, 2017. Following is a list of applicable codes:

<b>Code Type</b>	<b>Applicable Code (Model Code Basis)</b>
<b>Building</b>	780 CMR: Massachusetts State Building Code, 8 <sup>th</sup> Edition <sup>1</sup> (2009 International Building Code) (2009 International Existing Building Code)
<b>Fire Prevention</b>	527 CMR: Massachusetts Fire Prevention Regulations (2012 NFPA 1) M.G.L. Chapter 148 Section 26G – Sprinkler Protection
<b>Accessibility</b>	521 CMR: Massachusetts Architectural Access Board Regulations
<b>Electrical</b>	527 CMR 12.00: Massachusetts Electrical Code (2017 National Electrical Code)
<b>Elevators</b>	524 CMR: Massachusetts Elevator Code (2004 ASME A17.1)
<b>Mechanical</b>	2009 International Mechanical Code (IMC)
<b>Plumbing</b>	248 CMR: Massachusetts Plumbing Code
<b>Energy Conservation</b>	2015 International Energy Conservation Code

- 1 The 9<sup>th</sup> edition of 780 CMR based on the 2015 International Codes is expected to go into effect in 2017 and become mandatory for permit applications beginning on January 1, 2018.

## **International Existing Building Code**

The 2009 International Existing Building Code with Massachusetts amendments allows for 3 separate compliance methods, the Prescriptive Method (in general, altered areas must comply with the code for new construction), Work Area Method (level of compliance is based on the classification of work), and Performance Compliance Method (numerical method that allows tradeoffs for deficiencies). This report is based on the Work Area Method.

### **1. Work Area and Classification of Work:**

The proposed work includes an addition, change in use, and alterations to the existing building on the 2<sup>nd</sup>, a portion of the 1<sup>st</sup>, and the Basement levels. For the purposes of this report, it has been conservatively assumed that the renovations in the existing building will be classified as Level 3 alterations, which includes the reconfiguration of spaces, the addition or elimination of doors and windows, the reconfiguration or extension of systems, and/or the installation of additional equipment in more than 50% of the aggregate area of the building. Therefore, the work must comply with IEBC Chapters 6, 7, 8, 9, & 10.

No work is planned in the 1<sup>st</sup> Floor retail tenant space and it is my understanding this space is separated from the remainder of the building by 2 hour rated floor-ceiling assemblies. Therefore the retail space can be considered a separated use and further compliance with the IEBC in this area not required (IEBC 912.1.1.2).

**2. Occupancy Classification:**

Separated Use:

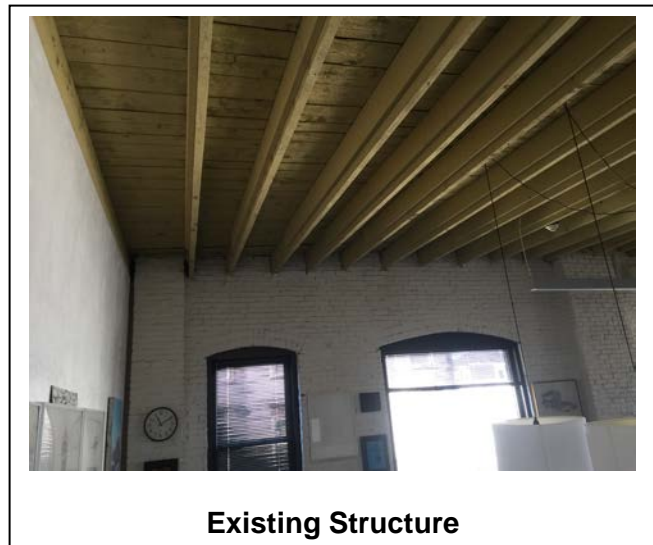
- Use Group M (Retail)

Non-Separated Uses

- Use Group R-2 (Apartments)
- Use Group B (Office Tenant)
- Use Group U (Covered Parking < 1,000 sqft. (780 CMR 406.1.1))

**3. Construction Type:**

The existing building consists of masonry exterior walls with a wood-framed interior and at a minimum can be classified as Type IIIB construction.



**4. Height and Area Limitations:**

Since there is a change in use to a higher height and area hazard category and there is an addition planned as part of this renovation, the building is required to comply with the height and area limitations for new construction (IEBC 912.5.1 & 1002.1).

**Use Group R-2**

Code Reference	Type IIIB	
	Height	Area
<u>780 CMR Table 503:</u> Tabular Value	4 St. (55 ft)	16,000 ft <sup>2</sup>
<u>780 CMR Section 504.2:</u> Sprinkler Height Increase	N/A	-
<u>780 CMR Section 506.3:</u> Sprinkler Area Increase	-	N/A
<b>Total Height and Area (per floor) Allowed</b>	<b>4 St. (55 ft)</b>	<b>16,000 ft<sup>2</sup></b>
<b>Actual Height and Area with Addition</b>	<b>4 St. (Approx. 42 ft) Approx. 3,800 ft<sup>2</sup> per Floor</b>	

As shown above, the building will comply with the height and area limitations. For Type IIIB new exterior walls must be constructed with noncombustible materials or fire retardant treated wood (780 CMR 602.3).

**5. Fire Resistance Ratings:**

The following table summarizes the required fire resistance ratings for the building elements of Type IIIB construction, based on 780 CMR Table 601 and other applicable code provisions:

Building Element	Type IIIB Fire Resistance Rating (Hrs)	Opening Protectives (Hrs)
Primary Structural Frame	0 <sup>A</sup>	
Exterior Bearing Walls (Non-combustible or Fire Retardant Treated Wood)	2	
Exterior Non-Bearing Walls (Non-combustible or Fire Retardant Treated Wood)	Based on Fire Separation Distance	
Interior Bearing Walls	0	
Floor Construction	0 <sup>B</sup>	
Roof Construction	0	
New or Existing Mechanical Shafts < 4 stories (780 CMR 708.2)	1	¾
Existing Stair Enclosures < 4 stories (IEBC 912.7.2 Exception 1)	0	0
Dwelling Unit Separation (780 CMR 420.2)	½	⅓
Residential Corridors (780 CMR Table 1018.1)	½	⅓

<sup>A.</sup> Not less than the rating of the assembly supported.

<sup>B.</sup> A 2 hour rated floor assembly is required to separate the dwelling units from the commercial space below as discussed above. The covered parking area must be separated from the dwelling unit above by at least 5/8" Type X gypsum board (780 CMR 406.1.4).

**6. Exterior Wall Rating:**

Since the renovation includes a change in use from B to R-2, there is no increase in the Exterior Wall Hazard Category and the existing exterior walls of the building are not required to comply with current code requirements (IEBC 912.6.1).

For the new addition the exterior wall rating requirements and opening limitations are based on the fire separation distance for each wall. The fire separation distance is measured perpendicular to the exterior wall to the centerline of a public street or an interior lot line (780 CMR 702.0). If the fire separation distance is more than 30 feet the wall is not required to be rated (780 CMR Table 602). The allowable area of exterior wall openings is not limited

when the fire separation distance is greater than 20 feet (780 CMR Table 705.8). Openings are not permitted when the fire separation distance is less than 3 feet in accordance with 780 CMR Table 705.8.

The East and South exterior walls of the new addition will be in close proximity to the lot line. Both are less than 30 feet from the lot line and therefore all solid portions of these walls require a 1 hour rating (780 CMR Table 602). Portions of these walls that are less than 3 feet from the lot line cannot have any openings. Both of these walls include sections that are set back just over 3 feet from the property line so that openings are permitted up to 15% of the wall area (780 CMR Table 705.8).

The West Wall exterior wall of the new addition appears to be approximately 20 feet from the centerline of Carlton Street. This allows unlimited unprotected exterior wall openings. Since this wall has a fire separation distance of less than 30 feet any solid portions also require a minimum fire rating of 1 hour.

## 7. Vertical Openings:

Since the change in use from B to R-2 results in an increase in the hazard index in Table 912.4 any existing vertical shafts must be 1 hour rated (IEBC 912.7.3), except for the existing stairs. Since the existing stairs from the Basement to the 1<sup>st</sup> Floor and from the First Floor to the 2<sup>nd</sup> Floor will not be open to one another and each only connects two stories they are permitted to remain open as shown on the plans (IEBC 912.7.2 & 703.2.1 Exception 11.1).

## 8. Interior Finishes:

The existing interior finish of walls and ceilings in the work area and in all exits and corridors serving the work area must comply with the code requirements for new construction (IEBC 703.4, 803.3, & 912.3). All newly installed wall and ceiling finishes, and interior trim materials must also comply with 780 CMR Table 803.9 (IEBC 602.1, 602.2, 602.3). The requirements are summarized below:

Walls & Ceilings (IBC Table 803.9)

Use Group:	B / M	R-2
Exit Stair	Class B	Class C
Exit Access Corridors	Class C	Class C
Rooms & Enclosed Spaces	Class C	Class C

## 9. Means of Egress:

Since the proposed change in use from B to R-2 is a higher hazard index in IEBC Table 912.4, the means of egress must comply with the code requirements for new construction (IEBC 912.4.1). However, if approved by the building official existing stairways, including handrails and guardrails, can continue to be used (IEBC 912.4.1 Exception 2).

	
<b>Existing Front Stair</b>	<b>Existing Rear Stair</b>

All areas of the building are provided with access to a minimum of two means of egress except for the 3<sup>rd</sup> and 4<sup>th</sup> Floors. However the occupied space on these two levels consists of a single unit, from which one means of egress is permitted by 780 CMR Section 1021.1 Exception 4.

The building must also comply with the following other code requirements for new construction:

- Maximum exit access travel distance must be less than 200 feet (780 CMR Table 1016.1).

The maximum exit access travel distance from the 4<sup>th</sup> Floor down the stairs and out of the building is approximately 150 feet.

- The maximum common path of travel cannot exceed 125 feet within an individual dwelling unit (780 CMR 1014.3 Exception 4).

All dwelling units have a common path of travel of less than 125 feet.

- Maximum Dead End Corridor Length must be < 50 feet or 2.5 times the least width of space (780 CMR 1018.4 Exception 2).

The only dead-end corridor is a small (approx. 6 foot long) dead-end leading to Unit D on the Second Floor.

- All means of egress lighting and exit signs throughout the building's common areas must be provided with an emergency power supply to assure continued illumination for not less than 1.5 hours in case of primary power loss (IEBC 805.2 & 805.3; and 780 CMR 1006.1 & 1011.1).

## 10. Required Fire Protection Systems

The following fire protection systems are required in the area undergoing a change in use (912.2). Areas that are separated from the change in use area (residential area) by 2 hour fire separation assemblies do not require coverage by these systems if no other work occurs in the space that would trigger compliance under the IEBC.

- NFPA 13 Automatic sprinkler system throughout all areas of the building that are not separated from the residential areas by 2 hour rated assemblies (IEBC 912.2.1 & 780 CMR Table 903.2 Note a(1)).

Sprinkler protection is also required by Massachusetts General Law, Chapter 148 Section 26I. This law requires sprinkler protection “in accordance with the provisions of the State Building Code” in a building with 4 or more residential units that is substantially rehabilitated so as to constitute the equivalent of new construction. The proposed approach under this law is to provide sprinkler protection throughout the residential areas and all other building areas not separated by 2 hour rated construction in accordance with the State Building Code.

- Fire alarm system in the R-2 areas (780 CMR 907.2.9)
- Single and multiple station smoke detectors in the R-2 areas (780 CMR 907.2.11.2)
- Fire extinguishers (527 CMR 1 Section 13.6 & 780 CMR 906.1)
- Carbon monoxide detection (527 CMR 1 Section 13.7.6)

## 11. Energy Code Provisions for Existing Buildings

The building is subject to the 2015 International Energy Conservation Code (IECC) including the amendments contained in 780 CMR Chapter 13. Alterations to existing buildings are permitted without requiring the entire building to comply with the energy requirements of the International Energy Conservation Code (IECC). The alterations (new elements) shall conform to the energy requirements of the IECC as they relate to new construction only (IEBC 711.1). However, if the new occupancy will result in an increase in demand for either fossil fuel or electrical energy, the building must comply with the energy conservation code in full (IECC 101.4.4).

The Massachusetts Stretch Code as adopted by the City of Somerville does not apply to altered existing buildings or additions (780 CMR Appendix AA 104).

## 12. Structural Provisions for Existing Buildings

Structural alterations to buildings must be evaluated by a registered structural engineer to determine compliance with the IEBC.

### **Massachusetts Architectural Access Board Regulations**

Since there will be less than 12 units in this existing building the residential common areas and residential units are not required to comply with the Massachusetts Architectural Access Board Regulations (521 CMR Sections 10.1, 9.2.1 & 9.4). Alterations by the building owner also do



not trigger further compliance for the existing building tenants to remain (although the existing retail tenant does already have an accessible entrance and toilet room (521 CMR 3.3.3)).