Department of Public Safety

Introduction to

The 2015 International Existing Buildings Code (IEBC)

Ninth Edition of The Massachusetts Building Code (780 CMR)

Robert Anderson

Director of Construction Code Education

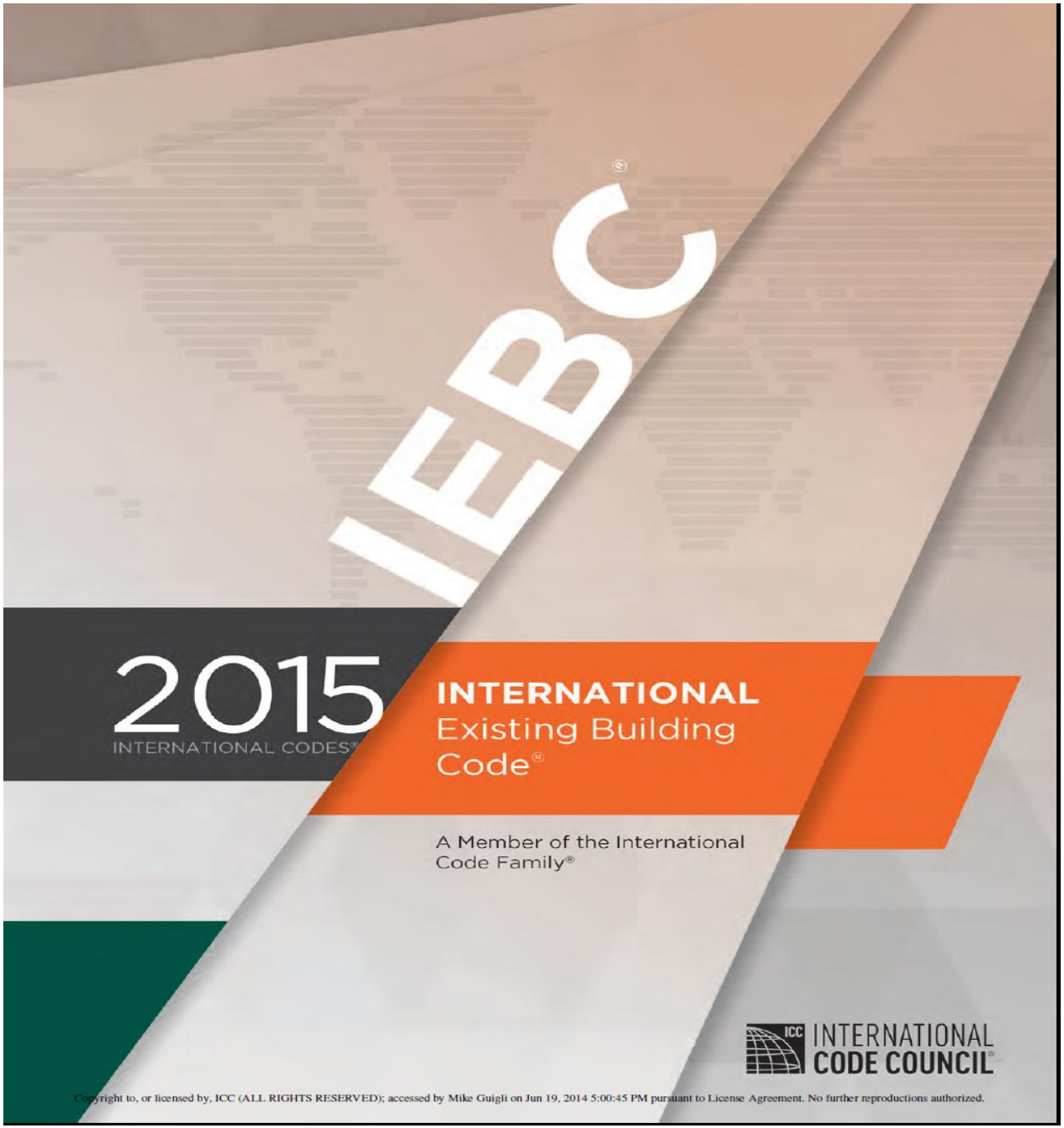
2015 IEBC

CHAPTER 34 – Existing Building Code

- *780 CMR 34 shall be the International Existing Building Code 2015*

With Massachusetts Amendments

- *101.1 Title. These regulations shall be known as the Existing Building Code of Massachusetts*


IEBC
2015
INTERNATIONAL CODES®
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Existing Building
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CHAPTER 34: EXISTING BUILDING CODE

780 CMR 34 shall be the *International Existing Building Code 2015* with Sections or text modified or added as follows:

101.1 Revise section as follows:

[A] 101.1 Title. These regulations shall be known as the *Existing Building Code* of *Massachusetts*, hereinafter referred to as "this code."

101.2 Revise section as follows:

[A] 101.2 Scope. The provisions of the *International Existing Building Code* shall apply to the *repair, alteration, change of occupancy, addition* to and relocation of *existing buildings*.

Notes:

1. If requirements in this code conflict with similar requirements in 780 CMR 1, then 780 CMR 1 applies.
2. When this code references requirements in other I-Codes see 780 CMR 1 for guidance on how to use those I-Codes.
3. Requirements in this code for plumbing, fuel gas, electrical, elevators, fire, or accessibility shall be replaced by the requirements of the Massachusetts specialty codes, as indicated in 780 CMR 1.

04.2.2.1 Revise subsection as follows:

104.2.2.1 Building investigation and evaluation. For any proposed work regulated by this code and subject to 780 CMR, Section 107, as a condition of the issuance of a permi the building *owner* shall cause the *existing building* (or portion thereof) to be investigate and evaluated in accordance with the provisions of this code. The investigation and evaluation shall be in sufficient detail to ascertain the effects of the proposed work on a least these systems: structural, means of egress, fire protection, energy conservation, lighting, hazardous materials, accessibility, and ventilation for the space under consideration and, where necessary, the entire building or structure and its foundation i impacted by the proposed work. The results of the investigation and evaluation, along with any proposed *compliance alternatives*, shall be submitted to the *building official* i written report form.

4.11 Revise section as follows:

2015 IEBC

Link to Massachusetts Amendments

http://www.mass.gov/eopss/docs/dps/buildingcode/inf4/bbrs2016-01-15-basecodepublic-comment.pdf

There are 7 pages of amendments to the IEBC beginning on Page 148 of the PDF package that is posted on the DPS website.

Amendments Include:

- ***Building Investigation & Evaluation***
- ***Compliance Alternatives***
- ***Sprinkler & Other Fire Protection Requirements***
- ***Structural Requirements***
- ***Peer Review***

DEFINITION

IEBC Existing Building

- ***A building erected prior to the date of adoption of the appropriate code, or one for which a legal building permit has been issued.***

- ***780 CMR Section 102.6 Existing Structures.*** ***The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code or as deemed necessary by the building official for the general safety and welfare of the public.***

IEBC Philosophy

- **IEBC Preface:** *"…intended to encourage the use and reuse of existing buildings while requiring reasonable upgrades and improvements…"*
- **ICC Workshop:** *"…provides a logical approach and predictable process…"*
- **7th edition and earlier:** *upgrades based on $$ and hazard index of use.*
- **8th & 9th editions (IEBC):** *upgrades based on work area ft^2 and other factors.*

COMPLIANCE METHODS

THREE METHODS

- ***Prescriptive;***
- ***Work Area; and***
- ***Performance.***

Only One Method may be chosen and applied throughout the project.

Acknowledgement

Portions of this presentation are derived from the International Code Council's, ***International Existing Building Code and Commentary*** ®, and ***International Building Code and Commentary*** ®, which are used with kind permission of the ICC as well as public domain documents acquired from the internet.

About the IEBC 2015

2015 IEBC added Chapter 3 titled Provisions for All Compliance Methods. It is intended to explain how the code is to applied for all methods. Other chapters are re-numbered accordingly.

About the IEBC 2015

TABLE OF CONTENTS

Prescriptive Method

- ***Reflected in Chapter 4 of IEBC is more simplistic than the Work Area Method.***
- ***More Administrative in nature.***
- ***Derived from Chapter 34 of earlier versions of the IBC, and is Prescriptive in nature.***

Prescriptive Method – Chapter 4

- ***Provides Basic Information for:***
- ***Additions – Section 402***
- ***Alterations – Section 403***
- ***Repairs – Section 404***
- ***Change of Use – Section 407***
- ***Historic Buildings – Section 408***

Also Provides Guidance for:

- ***Fire Escapes – Section 405***
- ***Glass and Window Replacement – Section 406***
- ***Accessibility – Section 410***

Prescriptive Method

- ***Controls the alteration, repair, addition and change of occupancy or relocation of existing buildings and structures.***
- ***Bleachers, Grandstands, Folding and Telescopic Seating comply with ICC 300***
- **ICC 300** *is a stand-alone standard to address bleacher safety, developed after the issue was highlighted when two U.S. congressmen petitioned the Consumer Product Safety Commission to develop such regulations. This standard has been approved for reference in the 2012 International Codes.*

Prescriptive Method

- ***Existing Materials*** *– Allowed to remain unless determined to be unsafe by the building code enforcement official.*
- ***New Materials*** *– Either compatible with existing or new code compliant.*
- ***Seismic Forces*** *– Guidance provided to engineers – typically directed to ASCE 7.*
- ***Dangerous Conditions During Renovations*** *– The building code enforcement official may require elimination.*
- ***Dangerous*** *defined by Chapter 2 as the structure has:*
- *Collapsed, partially collapsed, moved off foundation, lacks ground support, risk of collapse, detachment of any portion under service loads.*
- ***Unsafe*** *means unsanitary, or deficient due to inadequate means of egress, light, ventilation, fire, unsecured vacant structure.*

Prescriptive Method

- ***Section 402 Additions*** ***– Must comply with 780 CMR (IBC 2015) for new construction.***
- ***Section 403 Alteration*** ***– New building systems or portions thereof must comply with 780 CMR (IBC 2015) for new construction.***
- ***New and existing materials are permitted in accordance 401.2.***
- ***The altered building shall be no less conforming to the IBC than the existing building prior to alteration.***

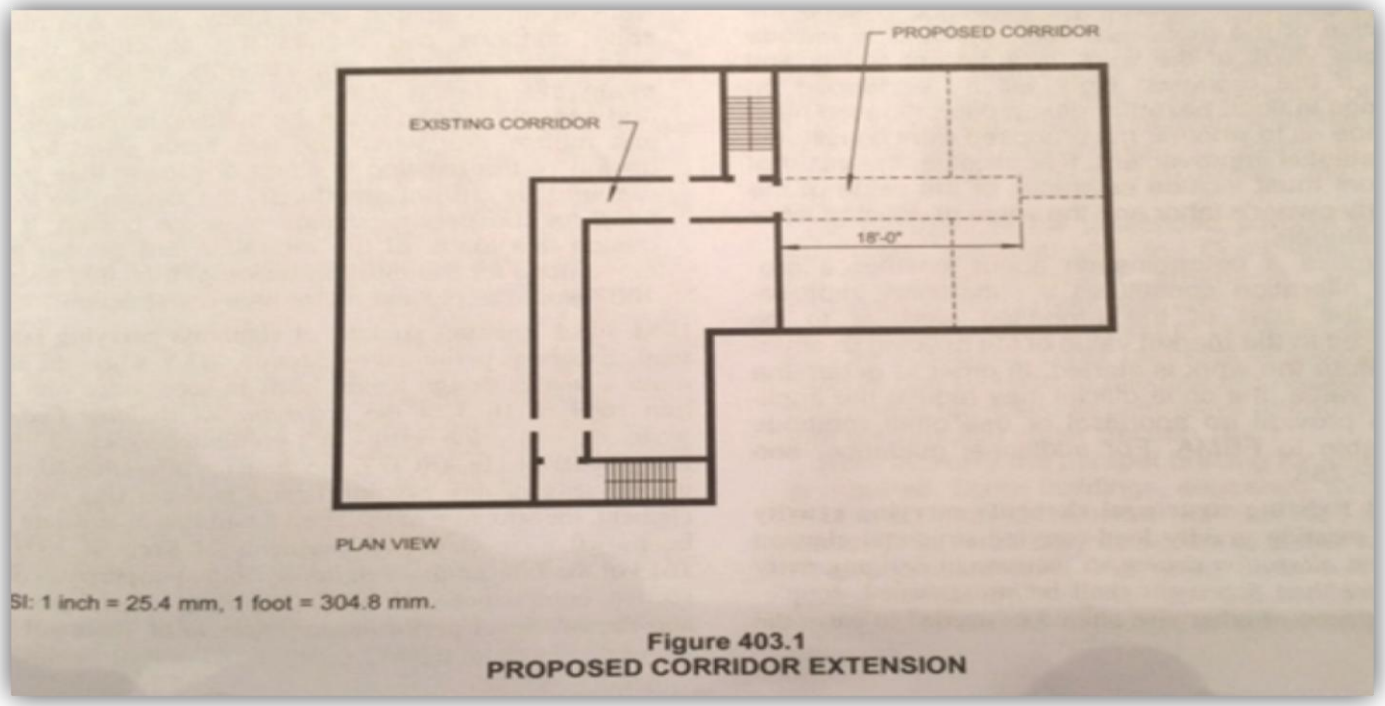


Figure 403.1
PROPOSED CORRIDOR EXTENSION

Prescriptive Method

- ***Section 402 Additions*** ***– Must comply with 780 CMR (IBC 2015) for new construction.***

Prescriptive Method

- ***Section 403 Alteration*** ***– New building systems or portions thereof must comply with 780 CMR (IBC 2015) for new construction.***
- ***New and existing materials are permitted in accordance 401.2.***
- ***The altered building shall be no less conforming to the IBC than the existing building prior to alteration.***

- ***Exceptions:***
- ***An existing stairway shall not be required to comply with requirements of IBC Section 1011 where space and construction does not allow a reduction in pitch or slope.***

SECTION 1011
STAIRWAYS

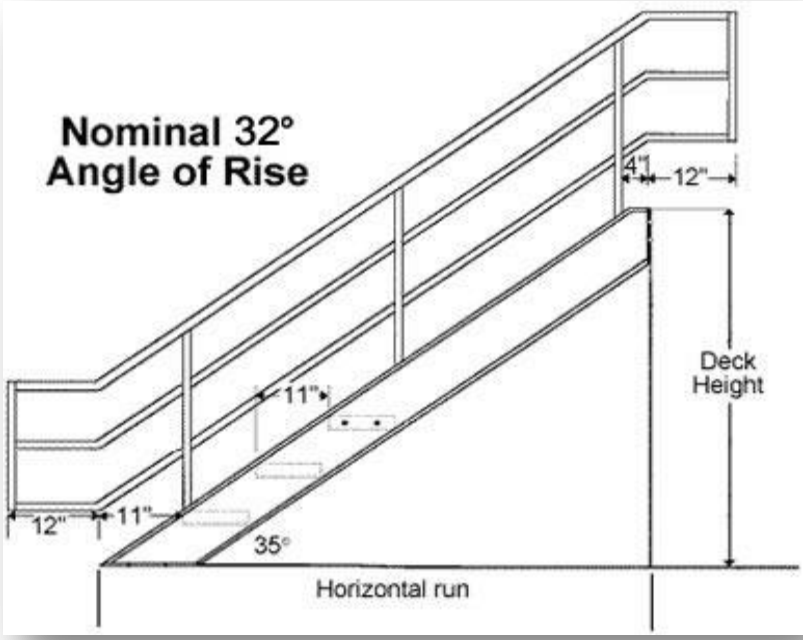
1011.1 General. *Stairways* serving occupied portions of a building shall comply with the requirements of Sections 1011.2 through 1011.13. *Alternating tread devices* shall comply with Section 1011.14. Ships ladders shall comply with Section 1011.15. Ladders shall comply with Section 1011.16.

Prescriptive Method

- ***Section 403 Alteration – New building systems or portions thereof must comply with 780 CMR (IBC 2015) for new construction.***

- ***Exceptions:***
- ***Handrails otherwise required to comply with IBC Section 1011.11 shall not be required to comply Section 1014.6 regarding full extension of the handrails where extensions would be hazardous due to plan configuration .***

1014.6 Handrail extensions. *Handrails* shall return to a wall, *guard* or the walking surface or shall be continuous to the handrail of an adjacent *flight* of *stairs* or *ramp* run. Where *handrails* are not continuous between *flights*, the *handrails* shall extend horizontally not less than 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At *ramps* where *handrails* are not continuous between runs, the *handrails* shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of *ramp* runs. The extensions of *handrails* shall be in the same direction of the *flights* of *stairs* at *stairways* and the *ramp* runs at *ramps*.



Prescriptive Method

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- ***Section 403 Alteration** – New building systems or portions thereof must comply with 780 CMR (IBC 2015) for new construction.*
- *New and existing materials are permitted in accordance 401.2.*
- *The altered building shall be no less conforming to the IBC than the existing building prior to alteration.*
- ***An alteration** is defined as any construction or renovation to an existing structure other than a repair or addition. Alterations are classified as Level 1, 2 and 3.*
- ***Section 404 Repairs** – Must comply with building material requirements of 401.2.*
- *Work on non-damaged components required for the repair are exempt from alteration requirements.*
- *Ordinary repairs do not require a permit.*
- *Structural damage that is not substantial can be restored to its original condition.*
- *Substantial structural damage must be repaired to meet minimum lateral and gravity loads.*

Prescriptive Method

104.2.2.1 Building investigation and evaluation. **For any proposed** work regulated by this code and subject to 780 CMR, Section 107, as a condition of the issuance of a permit the **building *owner*** *shall cause the existing building (or portion thereof) to be investigated* and evaluated in accordance with the provisions of this code. The investigation and evaluation shall be in sufficient detail to ascertain the effects of the proposed work on at least these systems:

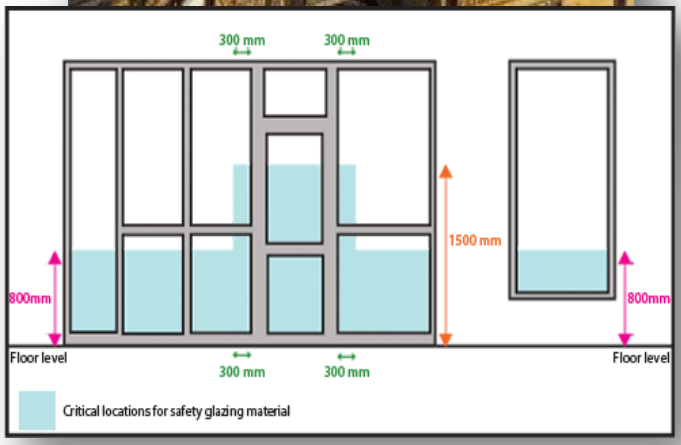
- **structural,**
- **means of egress,**
- **fire protection,**
- **energy conservation,**
- **lighting,**
- **hazardous materials,**
- **accessibility, and**
- **ventilation**

for the space under consideration and, where necessary, the entire building or structure and its foundation if impacted by the proposed work. The results of the investigation and evaluation, along with any proposed *compliance alternatives, shall be submitted to the building official in* written report form.

Prescriptive Method

- ***Section 405 Fire Escapes*** ***– May only be counted as a means of egress if tested and certified.***
- ***New fire escapes on existing buildings are only permitted if exterior stairs are not feasible due to lot restrictions. Escapes cannot be accessed through a window or incorporate ladders.***

- ***Section 406 Window and Glass Replacement*** ***- All new glass must meet new code requirements.***



Prescriptive Method

- ***Section 407 Change of Occupancy* – *Existing building\space must meet requirements for proposed occupancy.***
- ***Some concession allowed if new use is considered less hazardous based on life and fire risk.***
- ***Must meet electrical, mechanical and plumbing code requirements.***
- ***Section 408 Historic Buildings* – *Must be listed as preserved or partially preserved to take advantage of code allowances.***
- ***Building official allowed flexibility in flood hazard areas.***
- ***Section 409 Moved Structures* – *New systems must comply with 780 CMR (2015 IBC) for new construction.***
- ***Section 410 Accessibility* – *See 521 CMR.***

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4.11 Revise section as follows:

Prescriptive Method

Existing Building Investigation & Evaluation Report

Prescriptive Compliance Method

123 Main Street
Anytown, MA 00001

Prepared by:

Massachusetts Registered Design Professional (RDP)

August 24, 2016

Note:

*This report was developed for education purposes and is to be referenced only as a sample of what **may be provided** as part of an existing building investigation and evaluation report. Each building renovation project is unique and should be treated as such. Depending on the project, a greater or lesser level of detail may be required. This sample report may help to establish parameters for a project report, but should not be used as a gauge for code compliance. Photos contained herein were excerpted from internet public images. Information contained in this report is hypothetical and does not reflect actual conditions of internet images used.*

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Prescriptive Method

Part A.

Existing Building General Information:

1. Use Group Classification: Mixed Use of Office (B) and Storage (S-1).
2. Type of Construction: IIA
3. Area: 100,000 square feet
4. Height above grade plane: 30 feet
5. Stories above grade: 1 story, slab on grade
6. Sprinkler System: NFPA 13 system

The existing building was originally designed and constructed in xxxx in accordance with 780 CMR (The Massachusetts Building Code), Fifth Edition as a footwear storage warehouse and distribution center. According to the original building permit application, associated plans and specifications, the mixed used building was designed utilizing the non-separated use option, designed to the more restrictive S-1 code requirements as applicable. According to building department records, there have not been any additions or major renovations made to the structure since its original occupancy.

Ariel View of Site

The building sits on a ten acre parcel of land with full perimeter access, shared with 3 other existing retail buildings of similar construction type, with 6 points of fire department access to the site. Ample parking is available on site.

Part B.

Renovated Building General Specifications:

The existing building will be fully renovated in compliance with ***780 CMR, Ninth Edition, Existing Building Code Prescriptive Compliance Methods***. The renovated structure shall serve as a ***Bulk Merchandising Retail Building*** which is defined as *"A building where sales areas contain high piled combustible commodities, or high piled, high hazard commodities as defined in Chapter 3 and 4"*.

This report is prepared to assess existing conditions for the current use; identify any and all current code deficiencies requiring attention as part of the renovation project; and to generally assess the suitability of the structure for new use conditions. As required by 780 CMR Section 104.2.2.1, the report shall assess:

- Structural conditions;

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Prescriptive Method

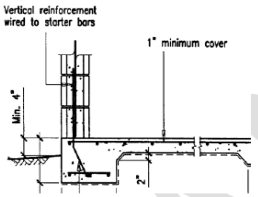
- means of egress conditions and requirements;
- fire protection systems;
- energy conservation conditions and requirements;
- lighting and ventilation conditions;
- hazardous materials; and
- accessibility to, in and around the building.

Part C.

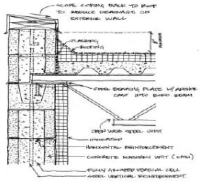
Existing Structural Conditions (*Construction Type, Height & Area Requirements*)**:**

The existing building conforms to Type IIA as established by 780 CMR, Ninth Edition, comprised of:

- Eight (8) inch split-faced, concrete masonry unit (CMU) exterior bearing walls, fully grouted and reinforced with #5 bars @ 4'-0" o.c.;
- Interior 6" x 6" nominal steel tube columns support, wide flange steel beams in 20'-0" bays;
- Open-web, steel bar joists @ 2'-0" o.c. roof structure with corrugated metal decking, light-weight concrete surface, rigid insulation and adhered, EPDM roof membrane (*see typical details below*).
- Interior walls are non-bearing, steel studs with ½" g.w.b. and skim coat of plaster.



Typical Exterior Wall Detail



Typical Roof Detail

Ninth Edition 780 CMR Section 602.2 establishes that *"Types I and II construction are those types of construction in which the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code"*. Type IIA construction shall achieve fire resistance ratings for structural elements as detailed in Table 601 (*copy of current table appended below*).

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame[f] (see Section 202)	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls Exterior[a, f] Interior	3 3[a]	2 2[a]	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	1½[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.

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Prescriptive Method

Assessment: The general condition of the structure appears to be in good shape. Construction documents on file at the building department indicate that appropriate live and dead loads were anticipated in the design and construction of the building and there have not been any significant building code changes affecting design loads that would necessitate change.

Height & Area Requirements: The existing building stands one (1) story, 30 feet above grade plane. **Ninth Edition, 780 CMR, Section 427.2** establishes that *" . . . unless otherwise noted in this section, the minimum requirements for bulk merchandising retail buildings shall be in accordance with the requirements set forth for Group M and Section 414".* **Tables 504.3** and **504.4** allow a maximum of 5 stories, 85 feet in height above grade plane for mercantile buildings. **Table 506.2** limits the building area to 86,000 square feet. However, 100% perimeter access and single-story occupancy provisions established by 780 CMR Section 506.3.2 allows for an area increase of approximately 16,000 square feet or 102,125 total square feet.

TABLE 504.4[a, b]—continued
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
M	NS	UL	11	4	2	4	2	4	3	1
	S	UL	12	5	3	5	3	5	4	2

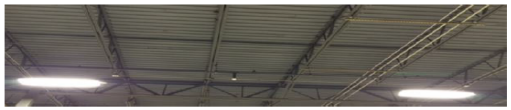
TABLE 504.3[a]
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A, B, E, F, M, S, U	NS[b]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

TABLE 506.2[a, b]
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
M	NS	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000
	S1	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000	36,000
	SM	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000	27,000

Deficiencies: Table 601 requires a one (1) roof construction fire resistance rating. Spray-on fire proofing was used to achieve required ratings. Portions of the rear north quadrant were missed and need to be protected. Protection material was applied properly in all other areas and is suitably in-tact.



Rear North Quadrant Requiring Fire Protection

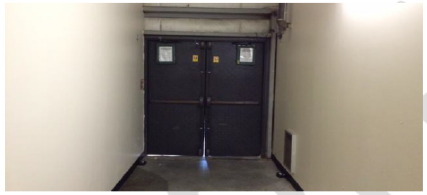
4

Prescriptive Method

Part D.

Means of Egress Conditions:

Assessment: Currently, there are six (6) points of entry and exit from the building. Some conditions do not comply with current or previous code editions as illustrated below. However, means of egress patterns, exit and entry doors will be totally reconfigured in conformance with 780 CMR, Ninth Edition, to accommodate the new ***Bulk Storage Merchandising Building*** use requirements. Construction documents for the renovation project will establish new means of egress patterns.



No Exit Signage

Part E.

Fire Protection Systems:

Assessment: The building is protected with a fire sprinkler system installed in accordance with NFPA Standard 13. Tests indicate that the system is in good working order. However, the system was originally designed for light hazard storage conditions. **Ninth Edition, 780 CMR Section 427.5** requires *"Fire sprinkler design and installation shall be provided in accordance with the applicable requirements set forth by NFPA 13, 30, 30B, 231, 430 or other nationally recognized codes and standards, or tests conducted in test laboratories as defined in 527 CMR".* Preliminary assessments indicate that the system will have to be redesigned to meet new commodities anticipated by the Bulk Merchandising Storage use. Additionally, the fire alarm and notification system will have to be redesigned in accordance with Table 427.4 and 427.14 requirements. Access doors, hose connections and manual smoke and heat vents exist and appear to be in good working order. Construction documents for the renovation project will illustrate revised systems in accordance with 780 CMR 427, Ninth Edition.

TABLE 427.4 FIRE PROTECTION REQUIREMENTS

Commodity Class[1]	Size of High-Piled Display Area[2] (sq. ft.)	Fire Protection Requirements				
		Fire Suppression System (427.5)	Fire Alarm/Notification (427.14)	Fire Department Access Doors (427.8)	Hose Connections (427.7)	Manual Smoke and Heat Vents (427.16)
I-IV	0 to 2,500	NR	NR	NR	NR	NR

NR = Not required.
1. For commodity classifications definitions, *see* subsection 427.3.
2. Areas that are separated by 60 ft of display area with such areas not used for high piled storage, or that are separated with a one-hour fire resistance-rated separation barrier, can be considered as separated high piled areas.
3. If the building is required to be sprinklered under this code, then the sprinkler system protecting the high piled storage area and 15 ft beyond shall be designed in accordance with the appropriate NFPA Standard(s).

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Prescriptive Method

Part F.

Energy Conservation Conditions and Requirements:

Assessment: Construction documents on file at the building department indicate that the insulation values for the existing roof system were designed and constructed in excess of code requirements when originally constructed and meet enhanced values established by 780 CMR, Ninth Edition, for the area. A new EPDM roof was installed in 2012. Construction documents for this roof replacement project indicate, in part that *"all existing R-values shall be maintained at the roof assembly and all damaged, missing and\or otherwise compromised existing rigid insulation shall be replaced as new . . ."*.

Deficiencies: There is no intent to replace or disturb the existing of assembly during transition to the Bulk Merchandising use. Therefore, there is no need to upgrade existing insulation values for the assembly. However, all interior wall surfaces will be stripped down to the face of existing CMU wall. New wall surfaces will be furred-out with metal studs @ 16" o.c. with new rigid R-19 insulation filling cavities, in excess of 780 CMR, Ninth Edition requirements.

Part G.

Lighting and Ventilation Conditions:

Assessment: All existing lighting and ventilation systems will be removed in their entirety. New systems will be reconfigured in conformance with 780 CMR, Ninth Edition, to accommodate the new ***Bulk Storage Merchandising Building*** use requirements. Construction documents for the renovation project will establish new lighting and ventilation conditions.

Part H.

Hazardous Materials:

Assessment: The existing building does not contain any hazardous materials. As mentioned earlier, all fire protection systems will be designed and installed in accordance with commodity requirements as established ***by Ninth Edition, 780 CMR, Table 427.4.***

Part I.

Accessibility to, in and around building:

Interior Assessment: All existing accessible routes within the building will be removed in their entirety. New accessible ingress and egress patterns, exit and entry doors, bathrooms, aisle ways, and check-out areas will be totally reconfigured in conformance with 780 CMR, Ninth Edition, and 521 CMR to accommodate the new ***Bulk Storage Merchandising Building*** use requirements. Additionally, the renovated structure will be designed in accordance with ADA standards for employee areas. Construction documents for the renovation project will establish new patterns.

Exterior Assessment: There are over 500 available parking spaces on site for use by patrons of the four existing structures. The lot was recently repaired and re-striped. All spaces are clearly delineated and 8 accessible spaces are dedicated to each of the 4 existing structures for a total of 32 available spaces. **521 CMR**

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Prescriptive Method

Section 23.2 establishes that parking facilities accommodating 501 – 1000 shall provide at least 2 percent of total as accessible spaces. Additionally, Section **23.2.2** requires *"One in every eight accessible spaces, but not less than one, shall be van accessible"*. Two (2) of the 8 spaces provided for each building are van accessible. All curb-cuts, walkways and exterior accessible routes are in compliance with applicable provisions of 521 CMR.

Deficiencies: None

This report is respectfully submitted in accordance with **Ninth Edition, 780 CMR, Section 104.2.2.1** ***Existing Building Code Prescriptive Compliance Methods.***

Registered Design Professional

Signed by:

August 24, 2016
Date:

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Work Area Method

- ***Chapters 5 through 13*** ***- More Flexibility to the User***
- ***DEFINITION of WORK AREA – That portion or portions of a building consisting of all reconfigured spaces as indicated on the construction documents. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed and portions of the building where work not initially intended by the owner is specifically required by this code (IEBC).***

- ***Reconfigured Space is a key term, but is not defined in the IEBC.***

Work Area Method

WEBSTER'S DICTIONARY Defines as

Reconfigure *(ˌriːkənˈfɪgə) vb*

1. *(Computer Science) (tr) to rearrange the elements or settings of (a system, device, computer application, etc)*

2. *(tr)* ***to rearrange the elements*** *or settings of (a system, device, computer application, etc)*

- *ICC Does publish guidance that suggests that reconfigured space includes movement, removal and\or installation of:*
- *Walls,*
- *Doors and*
- *Stairways*

Work Area Method

- ***Level 1 Alterations*** ***- alterations that include:***
- ***removal and replacement; or***
- ***covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.***

- ***Most Basic Form of Alteration*** ***- Examples***
- ***Roof replacement***
- ***Siding Replacement***

- ***Level 1 Alterations do not involved reconfigured space.***

Work Area Method – Chapter 7

- ***Level 1 Alterations*** **– *Chapter 7 prescribes requirements for all levels of alterations.***
- ***701.2 Basic Tenant*** **– *Level of safety shall not be reduced unless existing condition exceed current code minimum.***
- ***701.3 Flood Hazard Areas*** **– *Substantial Improvements***

  For the purpose of determining compliance with the flood provisions of this code, any *repair, alteration, addition,* or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure, before the improvement or *repair* is started. If the structure has sustained *substantial damage,* any repairs are considered *substantial improvement* regardless of the actual *repair* work performed. The term does not, however, include either:

  1. Any project for improvement of a building required to correct existing health, sanitary, or safety code violations identified by the *code official* and that is the minimum necessary to ensure safe living conditions; or

  2. Any *alteration* of a historic structure, provided that the *alteration* will not preclude the structure's continued designation as a historic structure.

Work Area Method – Chapter7

- *Level 1 Alterations – Chapter 7 prescribes requirements for all levels of alterations.*
- **Section 702 – Building Elements**
- **Section 703 – Fire Protection**
- **Section 704 – Means of Egress**
- **Section 705 – Accessibility**
- **Section 706 – Reroofing**
- **Section 707 – Structural**
- **Section708 – Energy Conservation**

Work Area Method

- ***Level 1 Alterations – Chapter 7 prescribes requirements for all levels of alterations.***
- ***Section 702 – Building Elements***
- ***Interior Finishes***
- ***Window Opening Control (Child Fall Protection)***
- ***Emergency Escape and Rescue***
- ***Materials and Methods***

Work Area Method

- ***Level I Alterations – Chapter 7 prescribes requirements for all levels of alterations.***
- ***Section 702 – Building Elements***
- ***Window Opening Control (Child Fall Protection) – Use Groups R-2 and R-3.***

Work Area Method

- ***Level 1 Alterations – Chapter 7 prescribes requirements for all levels of alterations.***
- ***Section 702 – Building Elements***
- ***Window Opening Control (Child Fall Protection) – Use Groups R-2 and R-3.***

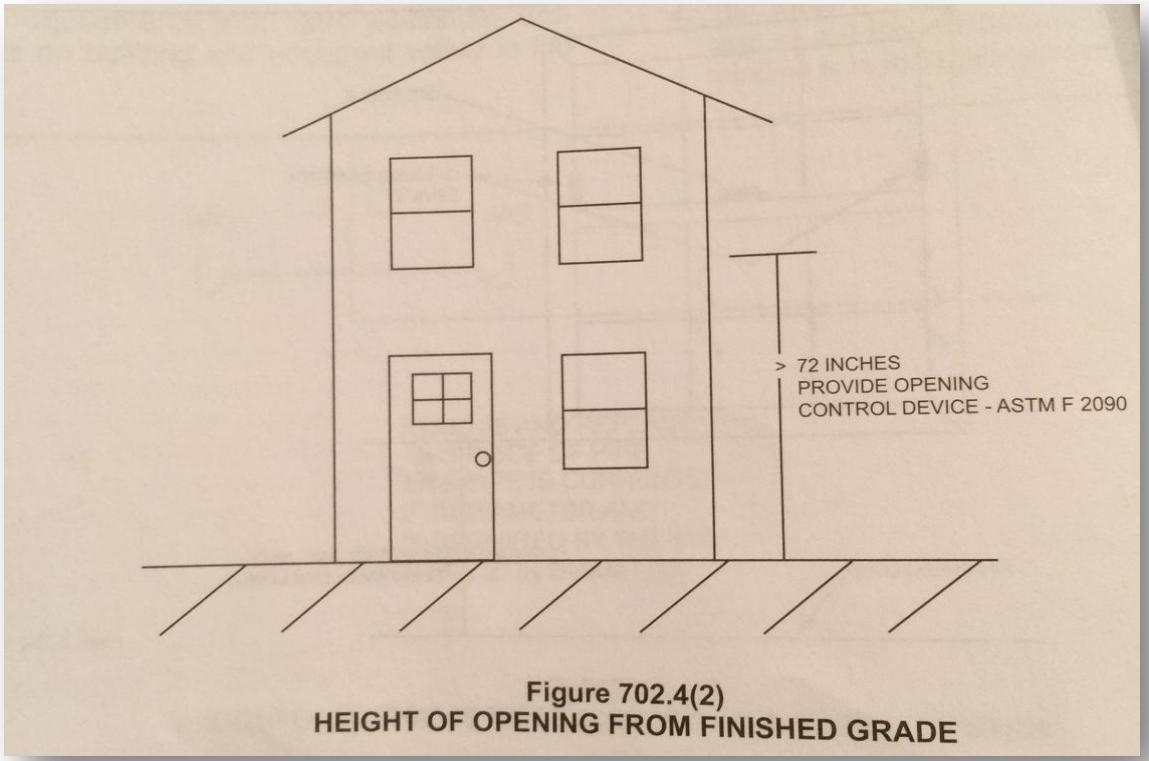
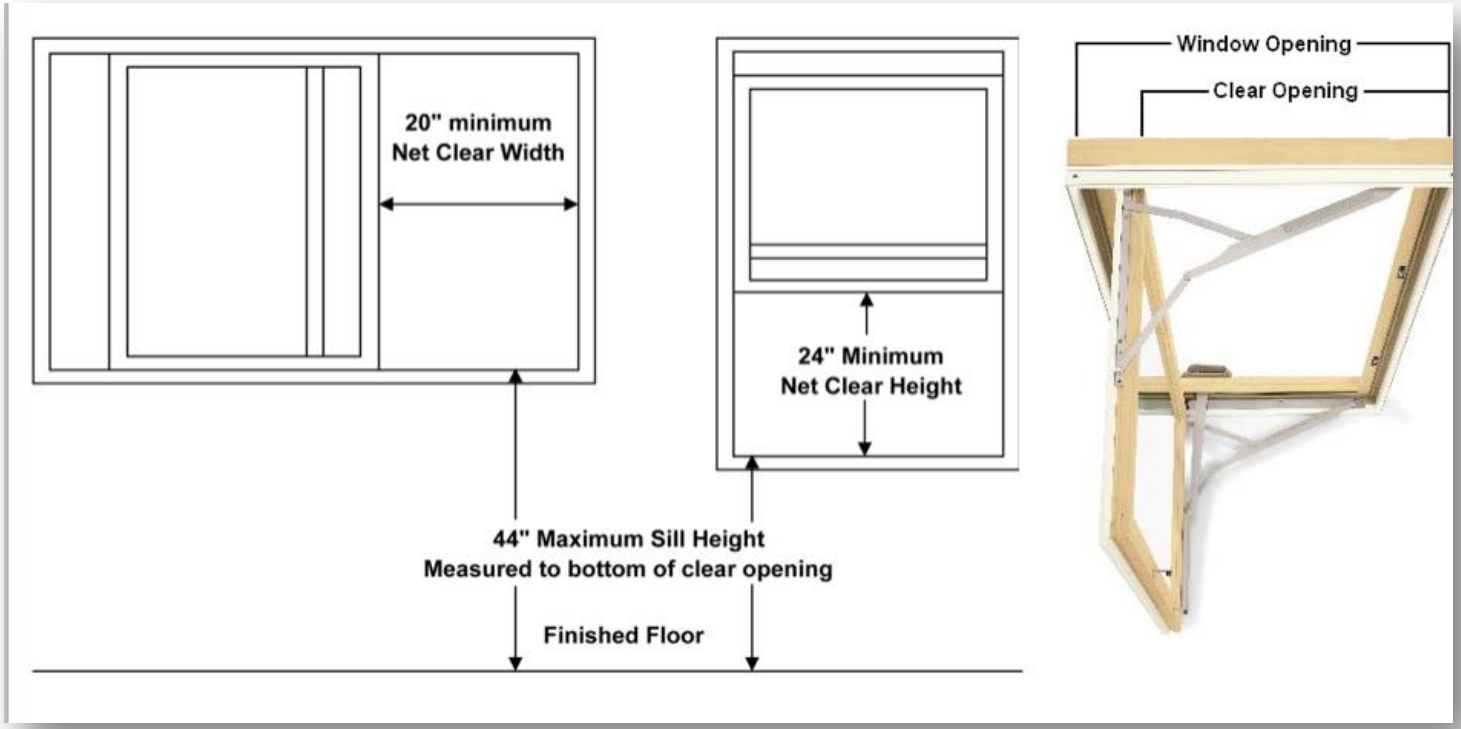


Figure 702.4(2)
HEIGHT OF OPENING FROM FINISHED GRADE

Work Area Method

- ***Level 1 Alterations – Chapter 7 prescribes requirements for all levels of alterations.***
- ***Section 702 – Building Elements***
- ***Emergency Escape and Rescue***



Work Area Method

- ***Level 1 Alterations –*** ***Chapter 7 prescribes requirements for all levels of alterations.***
- ***Section 702 – Building Elements***
- ***Materials and Methods Must Comply with New Code Requirements.***

Work Area Method

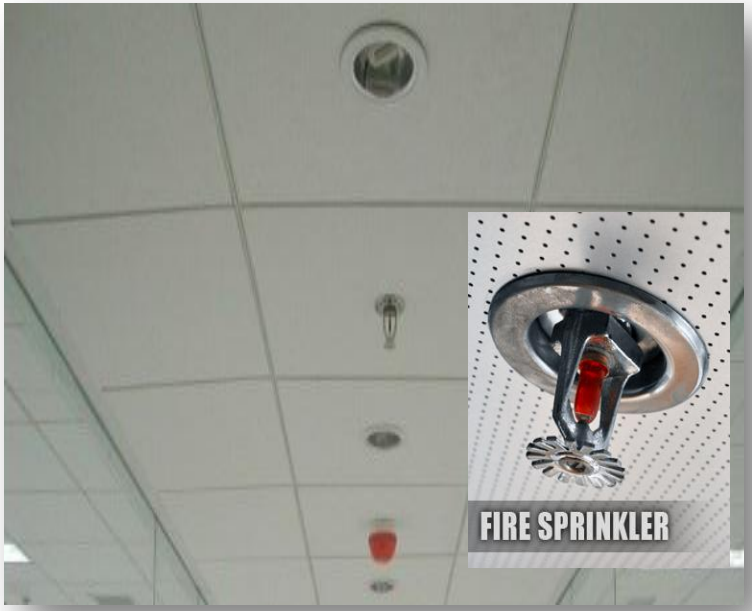
- ***Level 1 Alterations – Chapter 7 prescribes requirements for all levels of alterations.***
- ***Section 703 – Fire Protection***

  Simply Stated – Any alteration shall be done in a manner that maintains the level of fire protection provided.

  Example –

  Removing and replacing an existing ceiling in a sprinklered building

  Coverage must remain the same (unless in excess of current code requirements)



Work Area Method

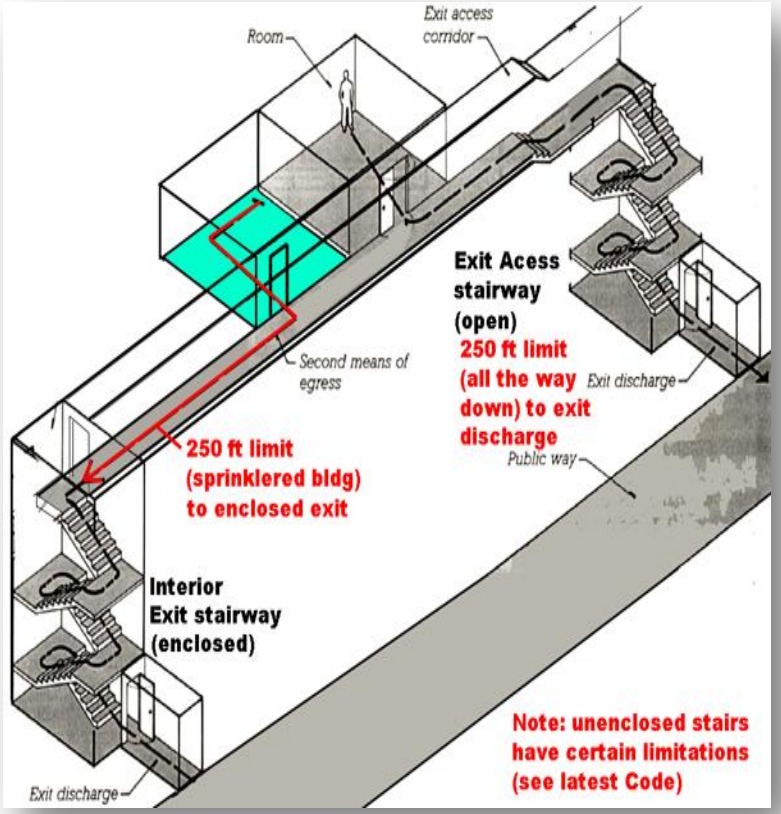
- **Level 1 Alterations –** Chapter 7 prescribes requirements for all levels of alterations.
- **Section 704 –** Means of Egress

  Simply Stated – Any alteration shall be done in a manner that maintains the level of protection provided for the means of egress.

  Example –

  Fire resistance ratings on corridors must be maintained

  Minimum door, corridor widths must be maintained



Work Area Method

- ***Level 1 Alterations*** **– Chapter 7 prescribes requirements for all levels of alterations.**

- ***Section 705*** **– Accessibility**

  Simply Stated **– See 521 CMR**

  http://www.mass.gov/eopss/architectural-access-board.html

Work Area Method

- ***Section 706 – Reroofing***

  Simply Stated – Materials and Methods Shall Comply with Chapter 15 of the IBC (Except low-sloped roofs – does not require ¼ unit vertical in 12 horizontal – but must provide positive drainage.)
- ***Structural Components Shall Support Roof Covering, Materials, and Equipment Loads.***
- ***Recovering v. Replacement – All existing layers must be removed if:***
- ***Existing is water-soaked or substantially deteriorated***
- ***Existing is wood shake, slate, clay, cement or asbestos-cement tile***
- ***Existing roof has two or more applications of any type of covering***

  4 Exceptions are allowed for certain metal roofs and ice barriers.

2 Exceptions Added by Massachusetts Amendment:

- For roof replacement and roof recover projects, where the existing roof assembly includes a built-up roof that is adhered to the roof deck, the existing built up roof shall be permitted to remain in place and be restored to good condition to serve as a sound substrate for the new roof covering, as per the roof manufacturer's requirements.
- For Roof Recover projects where there is only one layer of existing roofing present, existing continuous insulation shall be permitted to remain in place, provided all wet or otherwise deteriorated portions of the insulation is removed and replaced.

Work Area Method

- ***Level I Alterations – Chapter 7 prescribes requirements for all levels of alterations.***
- ***Section 707 – Energy Conservation***

  Simply Stated – Materials and Methods

- Level I *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* or *International Residential Code*.

- The *alterations* shall conform to the energy requirements of the *International Energy Conservation Code* or *International Residential Code* as they relate to new construction only

Work Area Method

- ***Level 2 Alterations – alterations include:***
- ***Reconfiguration of space***
- ***Installation of additional equipment that did not exist***
- ***Addition or elimination of doors and windows.***
- ***Level 2 Alterations presumes to include any Level 1 Alteration Work that may occur - cascades.***
- ***Level 2 work is considered extensive when compared to Level 1.***

Work Area Method

- ***Level 2 Alterations – Chapter 8 prescribes requirements.***
- ***801.2 Basic Tenant – Level of safety shall not be reduced unless existing condition exceed current code minimum.***

- **504.1 Scope.**
  Level 2 alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.

  504.2 Application.
  Level 2 alterations shall comply with the provisions of Chapter 7 for Level 1 alterations as well as the provisions of Chapter 8.

Work Area Method

Section 801 - General

Section 802 - Special Use and Occupancy

Section 803 - Building Elements and Materials

Section 804 - Fire Protection

Section 805 - Means of Egress

Section 806 - Accessibility

Section 807 - Structural

Section 808 - Electrical

Section 809 - Mechanical

Section 810 - Plumbing

Section 811 - Energy Conservation

Work Area Method

Section 801 General

- *All new construction elements, components, systems and spaces shall comply with requisite provisions of the IBC.*
- *Compliance with Level 1 work is expected.*

Exceptions:

- *Windows may be added without light and ventilation compliance*
- *Dead-end corridors*
- *Ceiling Heights for newly created habitable space may be 7 feet.*

Work Area Method

Section 802 Special Use and Occupancy

- ***Alteration of buildings classified as special use and occupancy as described in the International Building Code shall comply with the requirements of Section 801.1 and the scoping provisions of Chapter 1 where applicable.***
- ***In short, special uses such as covered mall buildings and high-rise buildings are treated the same as any other building when applying Alteration Level 2 requirements.***

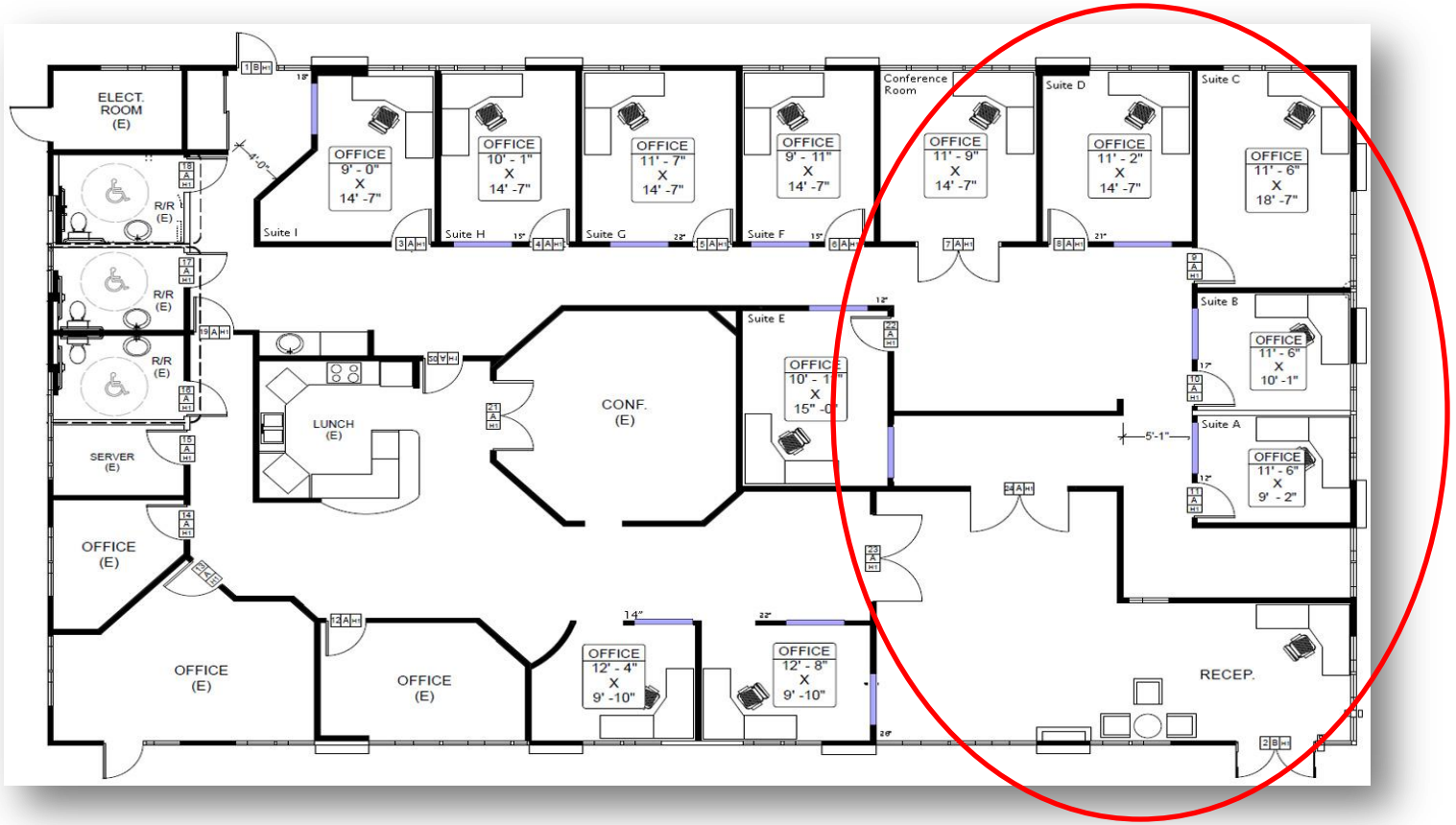
Work Area Method

Section 803 Building Elements and Materials

- ***Materials and Elements shall comply with new code***
- ***Supplemental Requirements for:***
- ***Vertical Openings – must be enclosed - 14 Exceptions***
- ***Supplemental Stairways – must be enclosed***
- ***Interior Finish – must be maintained***
- ***Guards – must be satisfactory in work area***
- ***Fire Resistance Ratings – must be maintained***

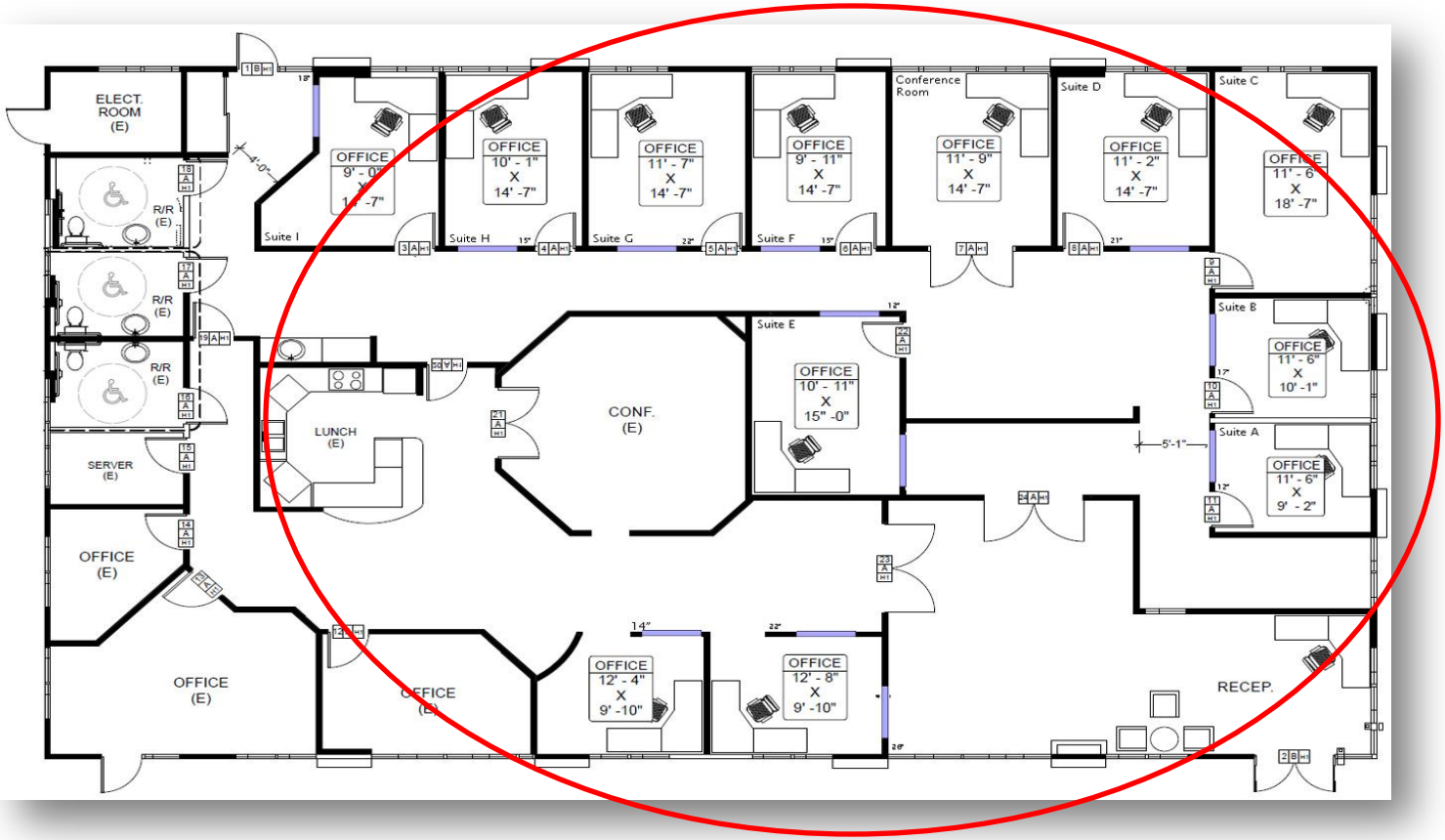
Work Area Method

Level 2 Work – Less than 50% of the floor area vs. more than 50%.



Work Area Method

Level 2 Work – Less than 50% of the floor area vs. more than 50%.



Work Area Method

Section 803.2 Floor Openings

- ***All floor openings must be enclosed with 1 hour fire resistance rated construction except:***
- ***Where permitted by the code for new construction***

Section 803.2 Floor Openings – Additional Requirements

- ***If work area exceeds 50% of the floor area, all vertical openings other than stairways must be enclosed – does not include vertical openings completely outside the scope of work.***
- ***If work area exceeds 50% of the floor area, egress stairways must be enclosed with at least smoke-tight construction from the highest work area floor and all floors below – unless enclosure is not required by 2015 IBC.***

Section 803.4 Interior Finishes – within a work area must comply with 2015 IBC – if the work area exceeds 50% of the floor area, the entire floor must use IBC approved finishes.

Work Area Method

Section 804 Fire Protection Systems – Apply to Work Areas

- ***Introducing a Fire Sprinkler System may allow trade-offs for fire resistance ratings, dampers, etc. allowing greater design flexibility.***
- ***Automatic sprinkler systems must be installed in all occupancies if:***
  - ***The work exceeds 50% of the floor area;***
  - ***The water supply is sufficient; and***
  - ***The IBC requires installation***
- ***Fire alarm and detection systems are required in certain occupancies.***
- ***Fire escapes are permitted to be used as means of egress if it meets requirements of 805.3.1.2.***
- ***Doorways and corridors in work areas typically follow new code requirements.***
- ***Energy requirements in work area must meet IECC, typically entire building need not comply.***

Work Area Method

- ***Level 3 Alterations*** *– Chapter 9 prescribes requirements.*
- ***901.2 Basic Tenant*** *– Level of safety shall not be reduced unless existing condition exceed current code minimum.*

- **505.1 Scope.**
  Level 3 alterations apply where the work area exceeds 50% of the aggregate building area.

  505.2 Application.
  Level 3 alterations shall comply with the provisions of Chapter 7 and 8 for Level 1 and 2 alterations as well as the provisions of Chapter 9.

Work Area Method

- ***Level 3 Alterations*** **– *Chapter 9 prescribes requirements.***
  50% of Building Area Rule.

Work Area Method

***Level 3 Alterations** – Chapter 9 prescribes requirements.*

- ***Existing stairways** that are part of a means of egress shall be protected by a 1 hour wall in accordance with 803.2.1 from the floor of the work area to the level of exit discharge (903.1).*
- ***Other vertical openings** shall be protected in accordance with Level 2 alterations.*
- ***Automatic sprinkler system** must be provided in all work areas where required by 804.2 (904.1); in addition M.G.L. c. 148 26G may require a sprinkler system in buildings undergoing major alterations.*
- ***Fire alarm and detection systems** must be provided throughout the building where required by the IBC (904.2).*
- ***Means of egress lighting** must be provided from the highest work area floor to the floor of exit discharge (905.2).*
- ***Exit signs** must be provided from the highest work area floor to the floor of exit discharge (905.3).*
- ***Energy** alterations within the work area must comply with IECC.*

Work Area Method

Level 3 Alterations *– Chapter 9 prescribes requirements.*

- ***Structural analysis required*** *– When more than 30% of total floor and roof areas are structurally altered over a 5 year period (Subject to IBC wind loading and reduced seismic forces).*

- *If less than 30% of total floor and roof areas are structurally altered - Must demonstrate that the altered building complies with the loads applicable at the time of original construction or most recent substantial renovation.*

CHAPTER 34: EXISTING BUILDING CODE

780 CMR 34 shall be the *International Existing Building Code 2015* with Sections or text modified or added as follows:

101.1 Revise section as follows:

[A] 101.1 Title. These regulations shall be known as the *Existing Building Code* of *Massachusetts*, hereinafter referred to as "this code."

101.2 Revise section as follows:

[A] 101.2 Scope. The provisions of the *International Existing Building Code* shall apply to the *repair, alteration, change of occupancy, addition* to and relocation of *existing buildings*.

Notes:

1. If requirements in this code conflict with similar requirements in 780 CMR 1, then 780 CMR 1 applies.
2. When this code references requirements in other I-Codes see 780 CMR 1 for guidance on how to use those I-Codes.
3. Requirements in this code for plumbing, fuel gas, electrical, elevators, fire, or accessibility shall be replaced by the requirements of the Massachusetts specialty codes, as indicated in 780 CMR 1.

04.2.2.1 Revise subsection as follows:

104.2.2.1 Building investigation and evaluation. For any proposed work regulated by this code and subject to 780 CMR, Section 107, as a condition of the issuance of a perm the building *owner* shall cause the *existing building* (or portion thereof) to be investigate and evaluated in accordance with the provisions of this code. The investigation and evaluation shall be in sufficient detail to ascertain the effects of the proposed work on a least these systems: structural, means of egress, fire protection, energy conservation, lighting, hazardous materials, accessibility, and ventilation for the space under consideration and, where necessary, the entire building or structure and its foundation i impacted by the proposed work. The results of the investigation and evaluation, along with any proposed *compliance alternatives*, shall be submitted to the *building official* i written report form.

4.11 Revise section as follows:

Work Area Method

Existing Building Investigation & Evaluation Report

Work Area – Alteration Level 3 Compliance Method

456 Main Street
Anywhere, MA 00002

Prepared by:

Massachusetts Registered Design Professional (RDP)

August 31, 2016

Note:

*This report was developed for education purposes and is to be referenced only as a sample of what **may be provided** as part of an existing building investigation and evaluation report. Each building renovation project is unique and should be treated as such. Depending on the project, a greater or lesser level of detail may be required. This sample report may help to establish parameters for a project report, but should not be used as a gauge for code compliance. Photos contained herein were excerpted from internet public images. Information contained in this report is hypothetical and does not reflect actual conditions of internet images used.*

1

Work Area Method

Part A.

Existing Building General Information:

1.	Use Group Classification:	Mixed Use of Office (B) and Assembly (A-3)
2.	Type of Construction:	IIA
3.	Area:	32,000 square feet per floor (*with a 650 square foot mezzanine above the fourth floor*)
4.	Height above grade plane:	52 feet
5.	Stories above grade:	4 stories with mezzanine , slab on grade
6.	Sprinkler System:	NFPA 13 system

The existing building was originally designed and constructed in March, 1997 in accordance with 780 CMR (The Massachusetts Building Code), Fifth Edition as a professional office building. The uppermost, mezzanine floor, is dedicated to company functions and is considered an assembly use under the former and current version of the code; otherwise the building is purely a business use with incidental storage areas for typical office supplies and files. According to the original building permit application, associated plans and specifications, the mixed used building was designed utilizing the separated use option. According to building department records, there have not been any additions or major renovations made to the structure since its original occupancy.

Ariel View of Site

The building sits on a ten acre parcel of land with full perimeter access, shared with 3 other existing retail buildings of similar construction type, with 6 points of fire department access to the site. Ample parking is available on site. A typical office floor plan is depicted below.

Typical Office Floor Plan Layout
(Floors 1 through 4)

2

Work Area Method

Part B.

Renovated Building General Specifications:

Approximately 60% of the existing building will be renovated to accommodate a new tenant (*roughly 20,000 square feet per floor – see highlighted area of typical floor plan*). Renovations will include, at minimum:

- Reconfiguring existing office and cubicle layout, floors 1 through 4;
- New entry, greeting and waiting area on the first floor;
- New tenant separation between existing engineering firm (who will continue to occupy the west side of the building, floors 1 through 4) and the new, legal consortium tenant;
- New carpet, painting and interior trim in both new and existing tenant spaces, mezzanine (*which will remain as an assembly gathering space for the new tenant*);
- New elevator cabs in each of the three existing banks; and
- New EPDM adhered roof.

The building will be renovated in compliance with ***780 CMR, Ninth Edition, Existing Building Code - Work Area, Level 3 Compliance Methods***. The renovated structure shall continue to serve as a professional office building with limited assembly and storage space.

This report is prepared to assess existing conditions for the current use; identify any and all current code deficiencies requiring attention as part of the renovation project; and to generally assess the suitability of the structure for new use conditions. As required by 780 CMR Section 104.2.2.1 and further enhanced by Work Level Chapters 7, 8 and 9, the report shall assess:

- Building elements, materials and finishes;
- structural conditions;
- means of egress conditions and requirements;
- fire protection systems;
- energy conservation conditions and requirements;
- lighting and ventilation conditions;
- hazardous materials;
- accessibility to, in and around the building;
- Reroofing provisions; and
- Electrical, mechanical and plumbing conditions.

Part C.

Existing Structural Conditions (*Construction Type, Height & Area Requirements*)**:**

The existing building conforms to Type IIA as established by 780 CMR, Ninth Edition, comprised of:

- Eight (8) inch split-faced, concrete masonry unit (CMU) exterior bearing walls, fully grouted and reinforced with #5 bars @ 4′-0″ o.c.;
- Interior 8″ x 8″ nominal steel tube columns support, wide flange steel beams in 20′-0″ bays;
- Open-web, steel bar joists @ 2′-0″ o.c. roof structure with corrugated metal decking, light-weight concrete surface, rigid insulation and adhered, EPDM roof membrane (*see typical details below*).
- Interior walls are non-bearing, steel studs with ½″ g.w.b. and skim coat of plaster.

3

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

- *Applies to alterations, repairs, additions and change of occupancies in existing buildings including historic and moved.*
- *Intended to maintain or increase the current level of safety, health and general welfare in existing buildings.*

Change in Occupancy

- *Provisions of this chapter must equate to new occupancy*

Partial Change in Occupancy

- *Separated by a fire barrier - only the section changed needs to comply*
- *Not separated - more stringent of the provisions between the two occupancies shall apply to the entire building*

Additions

- *Must meet IBC requirements for new construction.*
- *Cannot exceed height and area limitations of IBC.*
- *Fire wall provided between existing building and addition - addition can be considered a separate building.*

Alterations and Repairs

- *Existing building that do comply - alterations or repairs cannot result in the buildings being less safe.*

Performance Compliance Method

Chapter14* - *Scoring Method Focus on Fire Life Safety

The design evaluation is comprised of three main categories:

Fire Safety

- ***Structural Fire Resistance***
- ***Automatic Fire Detection***
- ***Fire Alarm***
- ***Fire-Suppression System***

Means of Egress

- ***Configuration***
- ***Characteristics***
- ***Support Features***

General Safety

- ***Fire Safety Parameters***
- ***Means of Egress Parameters***

CHAPTER 34: EXISTING BUILDING CODE

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101.2 Revise section as follows:

[A] 101.2 Scope. The provisions of the *International Existing Building Code* shall apply to the *repair, alteration, change of occupancy, addition* to and relocation of *existing buildings*.

Notes:

1. If requirements in this code conflict with similar requirements in 780 CMR 1, then 780 CMR 1 applies.
2. When this code references requirements in other I-Codes see 780 CMR 1 for guidance on how to use those I-Codes.
3. Requirements in this code for plumbing, fuel gas, electrical, elevators, fire, or accessibility shall be replaced by the requirements of the Massachusetts specialty codes, as indicated in 780 CMR 1.

04.2.2.1 Revise subsection as follows:

104.2.2.1 Building investigation and evaluation. For any proposed work regulated by this code and subject to 780 CMR, Section 107, as a condition of the issuance of a perm the building *owner* shall cause the *existing building* (or portion thereof) to be investigate and evaluated in accordance with the provisions of this code. The investigation and evaluation shall be in sufficient detail to ascertain the effects of the proposed work on a least these systems: structural, means of egress, fire protection, energy conservation, lighting, hazardous materials, accessibility, and ventilation for the space under consideration and, where necessary, the entire building or structure and its foundation i impacted by the proposed work. The results of the investigation and evaluation, along with any proposed *compliance alternatives*, shall be submitted to the *building official* i written report form.

4.11 Revise section as follows:

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4.11 Revise section as follows:

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety – Evaluation

Investigation & Evaluation Report Requires:

- *Structural Analysis (for new loads on existing building)*
- *Compliance Alternatives*
- *Compliance Method*

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety – Evaluation

All 21 points must be evaluated – nothing may be omitted.

- ***Building Height (1401.6.1)***
- ***Building Area (1401.6.2)***
- ***Compartmentation (1401.6.3)***
- ***Tenant & Dwelling Unit Separations (1401.6.4)***
- ***Corridor Walls (1401.6.5)***
- ***Vertical Openings (1401.6.6)***
- ***HVAC Systems (1401.6.7)***
- ***Automatic Fire Detection (1401.6.8)***
- ***Fire Alarm Systems (1401.6.9)***
- ***Smoke Control (1401.6.10)***
- ***Means of Egress (Capacity and Number) (1401.6.11)***
- ***Dead Ends (1401.6.12)***
- ***Travel Distance to an Exit (1401.6.13)***
- ***Elevator Control (1401.6.14)***
- ***Means of Egress Emergency Lighting (1401.6.15)***
- ***Mixed Occupancies (1401.6.16)***
- ***Automatic Sprinklers (1401.6.17)***
- ***Standpipes (1401.6.18)***
- ***Incidental Uses (1401.6.19)***
- ***Also, must consider Smoke compartmentation, patient ability, concentration, and attendant to patient ratio for 1-2 occupancies.***

Performance Compliance Method

Evaluation – Building Score Section 1401.7

TABLE 1401.7
SUMMARY SHEET-BUILDING CODE

Existing occupancy _____
Year building was constructed _____
Type of construction _____
Percentage of open perimeter increase _____%
Completely suppressed: Yes _____ No _____

Compartmentation: Yes _____ No _____
Fire-resistance rating of vertical opening enclosures _____
Type of HVAC system _____, serving number of floors _____
Automatic fire detection: Yes _____ No _____
Fire alarm system: Yes _____ No _____
Smoke control: Yes _____ No _____
Adequate exit routes: Yes _____ No _____
Maximum exit access travel distance _____
Means of egress emergency lighting: Yes _____ No _____
Standpipes Yes _____ No _____
Incidental use Yes _____ No _____
Smoke compartmentation less than 22,500 sq. feet (2092 m²) Yes _____ No _____

Proposed occupancy _____
Number of stories _____ Height in feet _____
Area per floor _____

Corridor wall rating _____
Type: _____
Required door closers: Yes _____ No _____
Type and location _____
Type _____
Type _____
Dead ends: _____ Yes _____ No _____
Elevator controls: Yes _____ No _____
Mixed occupancies: Yes _____ No _____
Patient ability for self-preservation _____
Patient concentration _____

Attendant-to-patient ratio _____

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1401.6.1 Building Height 1401.6.2 Building Area 1401.6.3 Compartmentation			
1401.6.4 Tenant and Dwelling Unit Separations 1401.6.5 Corridor Walls 1401.6.6 Vertical Openings			
1401.6.7 HVAC Systems 1401.6.8 Automatic Fire Detection 1401.6.9 Fire Alarm System			
1401.6.10 Smoke control 1401.6.11 Means of Egress 1401.6.12 Dead ends	* * * * * * * * * * * *		
1401.6.13 Maximum Exit Access Travel Distance 1401.6.14 Elevator Control 1401.6.15 Means of Egress Emergency Lighting	* * * * * * * *		
1401.6.16 Mixed Occupancies 1401.6.17 Automatic Sprinklers 1401.6.18 Standpipes 1401.6.19 Incidental Use 1401.6.20 Smoke compartmentation 1401.6.21.1 Patient ability for self-preservation 1401.6.21.2 Patient concentration 1401.6.21.3 Attendant-to-patient Ratio	* * * * * * * * * * * *	* * * * ÷2 =	
Building score—total value			

* * * *No applicable value to be inserted.

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Building Score Section 1401.7

TABLE 1401.8
MANDATORY SAFETY SCORES[a]

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-1	20	31	31
A-2	21	32	32
A-3	22	33	33
A-4, E	29	40	40
B	30	40	40
F	24	34	34
I-2	19	34	34
M	23	40	40
R	21	38	38
S-1	19	29	29
S-2	29	39	39

a. MFS = Mandatory Fire Safety.
MME = Mandatory Means of Egress.
MGS = Mandatory General Safety.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Height Evaluation:

- ***Allowable building height is based on an equation that correlates the allowable height in IBC, the actual building height and the construction type (1401.6.1).***

Formula:

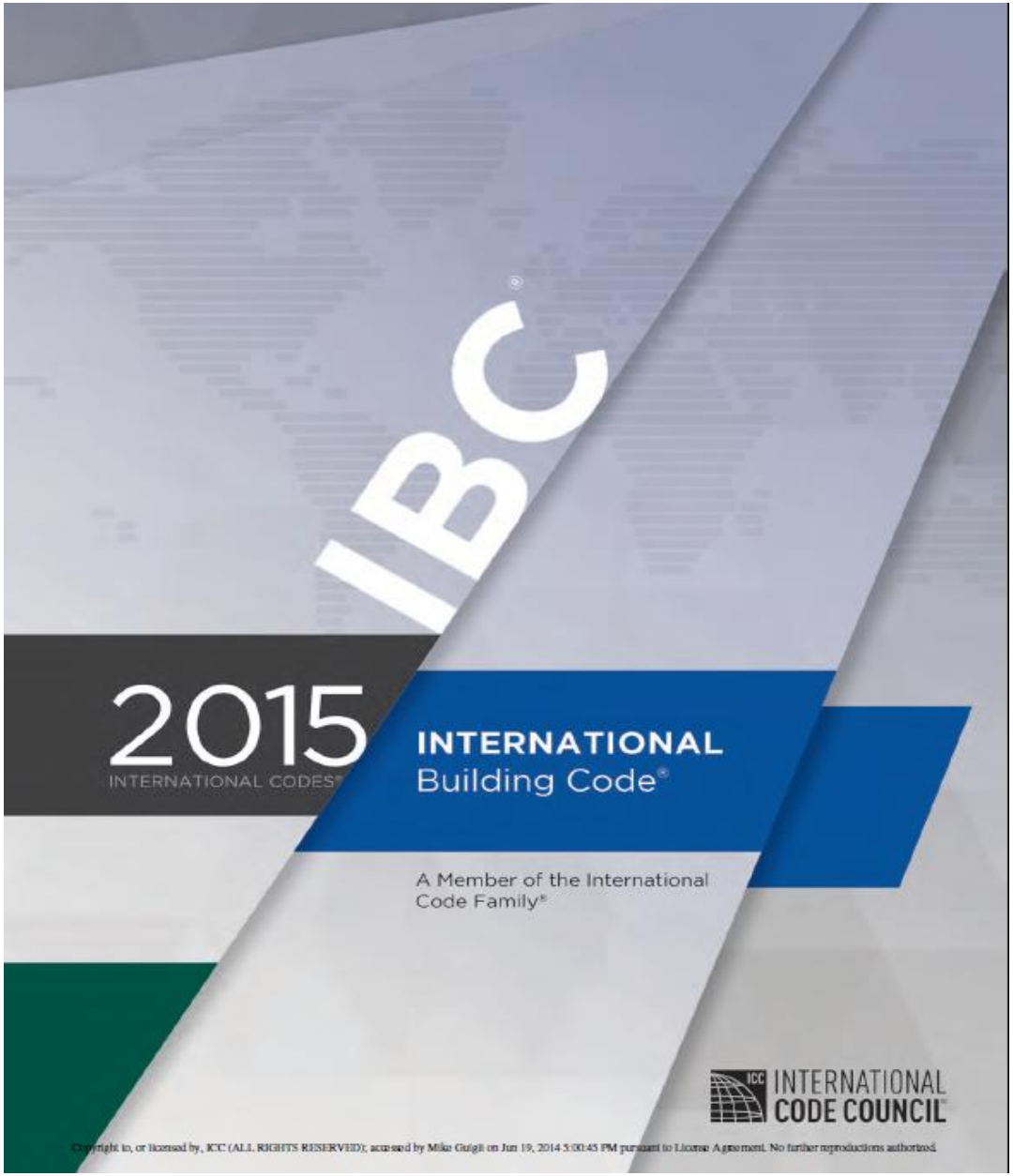
$$\text{Height value in feet} = \frac{(AH) - (EBH)}{12.5} \times CF$$

$$\text{Height value in stories} = (AS - EBS) \times CF$$

AH	*Allowable height in feet from IBC Section 504*
EBH	*Existing building height in feet*
AS	*Allowable height in stories from IBC Section 504*
EBS	*Existing building height in stories*
CF	*1 if (AH) – (EBH) is positive*
CF	*Construction types factor shown in Table 1401.6.6(2) if (AH) – (EBH) is negative*

Lesser Value is entered into Table 1401.7

Performance Compliance Method



Performance Compliance Method

Existing Building Investigation & Evaluation Report

Performance Compliance Method

678 Main Street
Anycity, MA 00003

Prepared by:

Massachusetts Registered Design Professional (RDP)

September 1, 2016

Note:

*This report was developed for education purposes and is to be referenced only as a sample of what **may be provided** as part of an existing building investigation and evaluation report. Each building renovation project is unique and should be treated as such. Depending on the project, a greater or lesser level of detail may be required. This sample report may help to establish parameters for a project report, but should not be used as a gauge for code compliance. Photos contained herein were excerpted from internet public images. Information contained in this report is hypothetical and does not reflect actual conditions of internet images used.*

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Performance Compliance Method

Part A.

Existing Building General Information:

1.	Use Group Classification:	Office (B) Building
2.	Type of Construction:	IIA
3.	Area:	40,000 square feet per floor
4.	Height above grade plane:	60 feet
5.	Stories above grade:	5 stories, slab on grade
6.	Sprinkler System:	Not sprinklered

Performance Compliance Method

Height Evaluation:

TABLE 504.4[a, b]—continued
ALLOWABLE NUMBER OF STORIES ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
B	NS	UL	11	5	3	5	3	5	3	2
	S	UL	12	6	4	6	4	6	4	3

TABLE 504.3[a]
ALLOWABLE BUILDING HEIGHT IN FEET ABOVE GRADE PLANE

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
A, B, E, F, M, S, U	NS[b]	UL	160	65	55	65	55	65	50	40
	S	UL	180	85	75	85	75	85	70	60

GRADE PLANE. A reference plane representing the average of finished ground level adjoining the building at *exterior walls*. Where the finished ground level slopes away from the *exterior walls*, the reference plane shall be established by the lowest points within the area between the building and the *lot line* or, where the *lot line* is more than 6 feet (1829 mm) from the building, between the building and a point 6 feet (1829 mm) from the building.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Height Evaluation: ***Example for a Type 11A, Business Use Building Occupancy***

AH	***65 feet***
EBH	***60 feet***
AS	***5 stories***
EBS	***5 stories***
CF	***1 from table 1401.6.6.(2) because 65 – 60 = 5 (a positive number)***

Height value in feet = (AH) – (EBH)/12.5 x CF

Height value in feet = (65) – (60)/12.5 x 1 = 0.4

Height value in stories = (AS – EBS) x CF

Height value in stories = (5 - 5) x 1 = 0

Lesser Value of 0 is entered into Table 1401.7

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Area Evaluation:

Allowable building area is based on the tabular value from the IBC as well as the actual area of the space (1401.6.2).

Formula:

$$A_a = A_t + (NS \times I_f)$$

A_a	*Allowable building area per story (sf)*
A_t	*Tabular allowable area factor (NS, S1, S13R, or SM value as applicable) in accordance with IBC Table 506.2*
NS	*Tabular allowable area factor in accordance with IBC Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered)*
I_f	*Area factor increase due to frontage as calculated in accordance with IBC Section 506.3*

Performance Compliance Method

Part A.

Existing Building General Information:

1.	Use Group Classification:	Office (B) Building
2.	Type of Construction:	IIA
3.	Area:	40,000 square feet per floor
4.	Height above grade plane:	60 feet
5.	Stories above grade:	5 stories, slab on grade
6.	Sprinkler System:	Not sprinklered

Performance Compliance Method

Formula

$$A_a = A_t + (NS \times I_f)$$

A_a *Allowable building area per story (sf)*

A_t *Tabular allowable area factor (NS, S1, S13R, or SM value as applicable) in accordance with IBC Table 506.2*

NS *Tabular allowable area factor in accordance with IBC Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered)*

I_f *Area factor increase due to frontage as calculated in accordance with IBC Section 506.3*

TABLE 506.2[a, b]
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
B	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000

Performance Compliance Method

Formula

$$A_a = A_t + (NS \times I_f)$$

A_a *Allowable building area per story (sf)*

A_t *Tabular allowable area factor (NS, S1, S13R, or SM value as applicable) in accordance with IBC Table 506.2*

NS *Tabular allowable area factor in accordance with IBC Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered)*

I_f *Area factor increase due to frontage as calculated in accordance with IBC Section 506.3*

TABLE 506.2[a, b]
ALLOWABLE AREA FACTOR (A_t = NS, S1, S13R, or SM, as applicable) IN SQUARE FEET

OCCUPANCY CLASSIFICATION	SEE FOOTNOTES	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
B	NS	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
	S1	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	SM	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000

Performance Compliance Method

AREA, BUILDING. The area included within surrounding *exterior walls* (or *exterior walls* and *fire walls*) exclusive of vent *shafts* and *courts*. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.

Formula

$$A_a = A_t + (NS \times I_f)$$

A_a	*Allowable building area per story (sf)*
A_t	*Tabular allowable area factor (NS, S1, S13R, or SM value as applicable) in accordance with IBC Table 506.2*
NS	*Tabular allowable area factor in accordance with IBC Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered)*
I_f	*Area factor increase due to frontage as calculated in accordance with IBC Section 506.3*

Performance Compliance Method

AREA, BUILDING. The area included within surrounding *exterior walls* (or *exterior walls* and *fire walls*) exclusive of vent *shafts* and *courts*. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.

Performance Compliance Method

Area Evaluation:

Formula

$$A_a = A_t + (NS \times I_f)$$

A_a *Allowable building area per story (sf)*

A_t *Tabular allowable area factor (NS, S1, S13R, or SM value as applicable) in accordance with IBC Table 506.2*

NS Tabular allowable area factor in accordance with IBC Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered)

I_f *Area factor increase due to frontage as calculated in accordance with IBC Section 506.3*

Performance Compliance Method

Area Evaluation:

Area factor increase due to frontage as calculated in accordance with IBC Section 506.3

In order to qualify, the building must have access to a public way.

The theory behind an increase due to frontage:

- ***Allows fire-fighter access***
- ***Provides a refuge for building occupants***
- ***Reduces exposure to other buildings***

Performance Compliance Method

Area increase due to frontage is calculated by:

$$W = (L_1 \times w_1 + L_2 \times w_2 + L_3 \times w_3 \ldots)/F \qquad \textbf{(Equation 5-4)}$$

where:

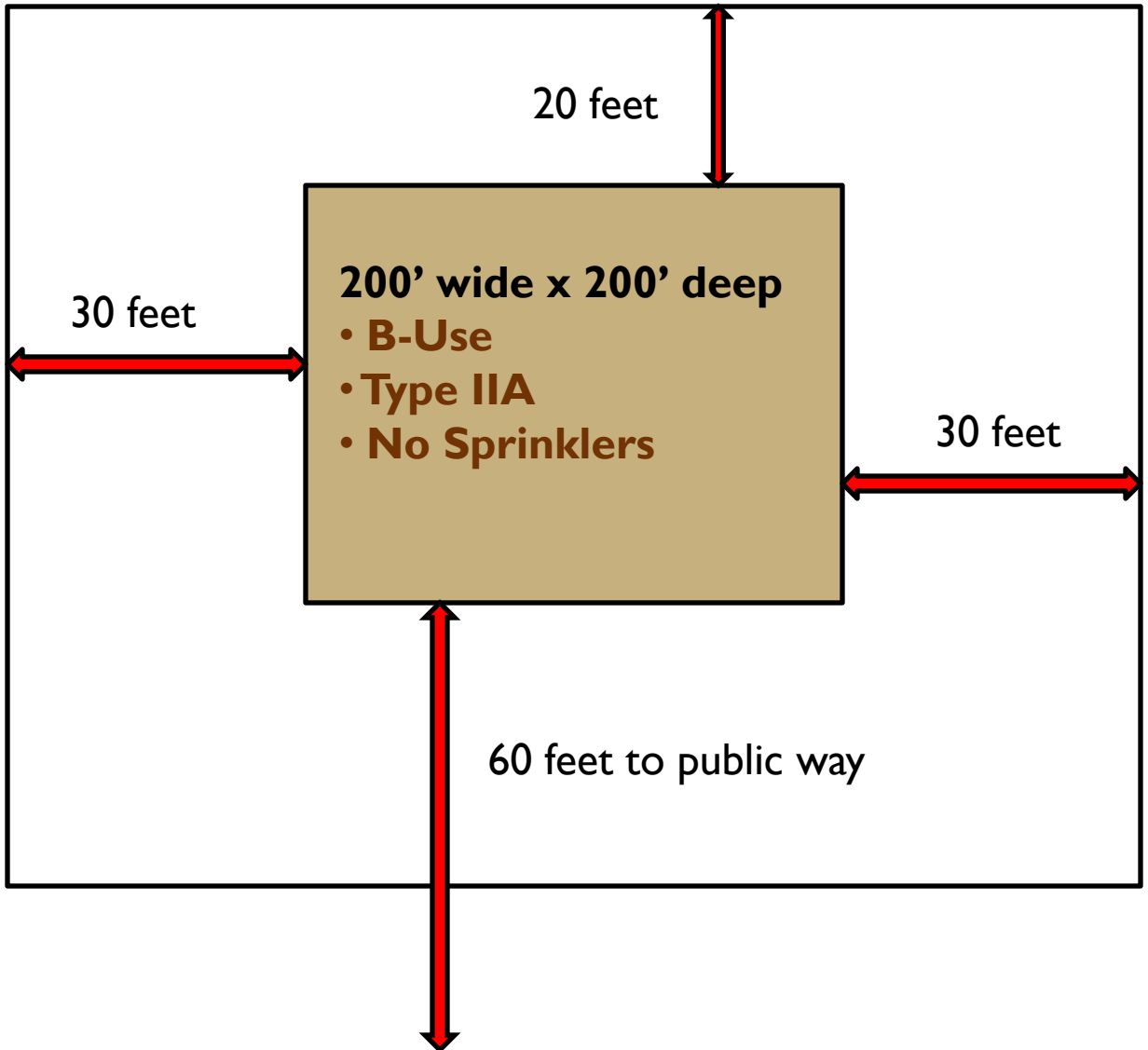
W (Width: weighted average) = Calculated width of public way or open space (feet).

L_n = Length of a portion of the exterior perimeter wall.

w_n = Width ($\geq$ 20 feet) of a public way or open space associated with that portion of the exterior perimeter wall.

F = Building perimeter that fronts on a public way or open space having a width of 20 feet (6096 mm) or more.

Performance Compliance Method



Performance Compliance Method

506.3.3 Amount of increase. The area factor increase based on frontage shall be determined in accordance with Equation 5-5:

$I_f = [F/P - 0.25]W/30$ **(Equation 5-5)**

where:

I_f = Area factor increase due to frontage.

F = Building perimeter that fronts on a *public way* or open space having minimum distance of 20 feet (6096 mm).

P = Perimeter of entire building (feet).

W = Width of *public way* or open space (feet) in accordance with Section 506.3.2.

Equation 5-5

$I_f = [F/P - 0.25]W/30$

$I_f = [200 + 200 + 200 + 200/800 - 0.25]27.5/30 = (.75)(.91) = .68$

W = the weighted averages of the building perimeter with 20' but 30' maximum used in equation (Derived from Equation 5-4).

$W = [(200)(30) + (200)(30) + (200)(20) + (200)(30)]/800 = 27.5$

Performance Compliance Method

$$W = (L_1 \times w_1 + L_2 \times w_2 + L_3 \times w_3 \ldots)/F \qquad \textbf{(Equation 5-4)}$$

where:

W (Width: weighted average) = Calculated width of public way or open space (feet).

L_n = Length of a portion of the exterior perimeter wall.

w_n = Width ($\geq$ 20 feet) of a public way or open space associated with that portion of the exterior perimeter wall.

F = Building perimeter that fronts on a public way or open space having a width of 20 feet (6096 mm) or more.

Performance Compliance Method

Area Evaluation:

Formula:

1401.6.2.1 Allowable area formula. The following formula shall be used in computing allowable area:

$$A_a = A_t + (NS \times I_f) \qquad \textbf{(Equation 14-3)}$$

where:

A_a = Allowable building area per story (square feet).

A_t = Tabular allowable area factor (NS, S1, S13R, or SM value, as applicable in accordance with Table 506.2 of the *International Building Code*.

NS = Tabular allowable area factor in accordance with Table 506.2 of the *International Building Code* or nonsprinklered building (regardless of whether the building is sprinklered).

I_f = Area factor increase due to frontage as calculated in accordance with Section 506.3 of the *International Building Code*.

Performance Compliance Method

Area Evaluation:

Formula

$A_a = A_t + (NS \times I_f)$

$A_a = 37{,}500 + (37{,}500 \times .68) = 37{,}500 + 25{,}500 = 63{,}000$ *sf / story*

A_a *Allowable building area per story (sf)*

A_t *Tabular allowable area factor (NS, S1, S13R, or SM value as applicable) in accordance with IBC Table 506.2*

NS Tabular allowable area factor in accordance with IBC Table 506.2 for nonsprinklered building (regardless of whether the building is sprinklered)

I_f *Area factor increase due to frontage as calculated in accordance with IBC Section 506.3*

Performance Compliance Method

Chapter14* - *Scoring Method Focus on Fire Life Safety

Area Evaluation:

- ***Allowable building area is based on the tabular value from the IBC as well as the actual area of the space (1401.6.2).***

Formula

$$\text{Area value}_i = \frac{\text{Allowable area}_i}{1200 \text{ square feet}} \left[1 - \left(\frac{\text{Actual area}_i}{\text{Allowable area}_i} + \ldots + \frac{\text{Actual area}_n}{\text{Allowable area}_n} \right) \right]$$

(Equation 14-4)

where:

i = Value for an individual separated occupancy on a floor.

n = Number of separated occupancies on a floor.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Area Evaluation:

Example:

- *5 Story, 40,000 sf, Type IIA, Nonsprinklered, Business Occupancy Building*
- *Commentary indicates that if there is only one occupancy, the formula Reduces to the allowable area (63,000) minus the actual area (40,000) divide by the constant 1200.*
- *63,000 – 40,000/1200 = 19.17*

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Compartmentation Evaluation

- ***Points are awarded based on the size of the compartment enclosed by fire barrier walls and floor/ceiling assemblies.***

TABLE 1401.6.3
COMPARTMENTATION VALUES

OCCUPANCY	CATEGORIES				
	a Compartment size equal to or greater than 15,000 square feet	b Compartment size of 10,000 square feet	c Compartment size of 7,500 square feet	d Compartment size of 5,000 square feet	e Compartment size of 2,500 square feet or less
A-1, A-3	0	6	10	14	18
A-2	0	4	10	14	18
A-4, B, E, S-2	0	5	10	15	20
F, M, R, S-1	0	4	10	16	22

For SI: 1 square foot = 0.0929 m^2.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Compartmentation Section 1401.6.3

Points are awarded based on occupancy and fireresistance rating of the barrier.

- ***a.*** ***No fire partitions; incomplete fire partitions; no doors; doors not self closing or automatic closing***
- ***b.*** ***Less than 1 hour assembly, or not constructed in accordance with Chapter 7 of IBC***
- ***c.*** ***1+ hour fire partitions and 1-2 hour fire rated floor assemblies in accordance with Chapter 7 of IBC***
- ***d.*** ***1-2 hour fire partitions and 2+ hour or greater fire-resistance rated floor assemblies***
- ***e.*** ***2+ hour fire barriers and floor assemblies in accordance with Chapter 7 of IBC***

TABLE 1401.6.3
COMPARTMENTATION VALUES

OCCUPANCY	CATEGORIES				
	a Compartment size equal to or greater than 15,000 square feet	b Compartment size of 10,000 square feet	c Compartment size of 7,500 square feet	d Compartment size of 5,000 square feet	e Compartment size of 2,500 square feet or less
A-1, A-3	0	6	10	14	18
A-2	0	4	10	14	18
A-4, B, E, S-2	0	5	10	15	20
F, M, R, S-1	0	4	10	16	22

For SI: 1 square foot = 0.0929 m².

Performance Compliance Method

Chapter14 - *Scoring Method Focus on Fire Life Safety*

Evaluation – Tenant/Dwelling Separation Section 1401.6.4

Points are awarded based on occupancy and fireresistance rating of the barrier.

TABLE 1401.6.4
SEPARATION VALUES

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1	0	0	0	0	1
A-2	-3	-3	0	1	3
R	-4	-2	0	2	4
A-3, A-4, B, E, F, M, S-1	-4	-3	0	2	4
I-2	0	1	2	3	4
S-2	-5	-2	0	2	4

Performance Compliance Method

Chapter14 - *Scoring Method Focus on Fire Life Safety*

Evaluation – Tenant/Dwelling Separation Section 1401.6.4

Points are awarded based on occupancy and fireresistance rating of the barrier.

1401.6.4.1 Categories. The categories for tenant and dwelling unit separations are:

1. Category a—No fire partitions; incomplete fire partitions; no doors; doors not self-closing or automatic-closing.
2. Category b—Fire partitions or floor assemblies with less than 1-hour fire-resistance ratings or not constructed in accordance with Section 708 or 711 of the *International Building Code*, respectively.
3. Category c—Fire partitions with 1-hour or greater fire-resistance ratings constructed in accordance with Section 708 of the *International Building Code* and floor assemblies with 1-hour but less than 2-hour fire-resistance ratings constructed in accordance with Section 711 of the *International Building Code* or with only one tenant within the floor area.
4. Category d—Fire barriers with 1-hour but less than 2-hour fire-resistance ratings constructed in accordance with Section 707 of the *International Building Code* and floor assemblies with 2-hour or greater fire-resistance ratings constructed in accordance with Section 711 of the *International Building Code*.
5. Category e—Fire barriers and floor assemblies with 2-hour or greater fire-resistance ratings and constructed in accordance with Sections 707 and 711 of the *International Building Code*, respectively

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Corridor Walls Section 1401.6.5

Points are awarded based on occupancy and fireresistance rating of the barrier.

- ***a. No fire partitions; incomplete fire partitions; no doors; doors not self closing or automatic closing***
- ***b. Less than 1 hour fire-resistance rating, or not constructed in accordance with Chapter 7 of IBC***
- ***c. 1-2 hour fire partitions in accordance with Chapter 7 of IBC or without corridors as permitted by Section IBC 1018***
- ***d. 2+ hour fire-resistance rating with doors in accordance with Chapter 7 of IBC.***

TABLE 1401.6.5
CORRIDOR WALL VALUES

OCCUPANCY	CATEGORIES			
	a	b	c[a]	d[a]
A-1	-10	-4	0	2
A-2	-30	-12	0	2
A-3, F, M, R, S-1	-7	-3	0	2
A-4, B, E, S-2	-5	-2	0	5
I-2	-10	0	1	2

a. Corridors not providing at least one-half the exit access travel distance for all occupants on a floor shall use Category b.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Vertical Openings Section 1401.6.6

- ***Points are awarded based on the opening protection value which is then multiplied by the construction-type factor.***

TABLE 1401.6.6(1)
VERTICAL OPENING PROTECTION VALUE

PROTECTION	VALUE
None (unprotected opening)	-2 times number of floors connected
Less than 1 hour	-1 times number of floors connected
1 to less than 2 hours	1
2 hours or more	2

- ***A protection value of 2 can be granted for single story buildings or if all unenclosed vertical openings conform to IBC Section 708.***

TABLE 1401.6.6(2)
CONSTRUCTION-TYPE FACTOR

FACTOR	TYPE OF CONSTRUCTION								
	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
	1.2	1.5	2.2	3.5	2.5	3.5	2.3	3.3	7

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Evaluation – Vertical Openings Section 1401.6.6

Formula

$$VO = PV \times CF$$

VO	***Vertical opening value***
PV	***Protection value from Table 1401.6.6(1)***
CF	***Construction type factor from Table 1401.6.6(2)***

If no protection in a 3 story, type VA building, Table 1401.6.6(1) value = 3 x -2 = -6 and construction factor is 3.3.

$$VO = -6 \times 3.3 = -19.8$$

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – HVAC Systems Section 1401.6.7

Points are awarded based on the ability of the system to resist smoke And fire movement.

a. ***Plenums not in accordance with IMC 602 (-10 Points)***
b. ***Air movement in egress elements not in accordance with IBC 1018.5 (-5 points)***
c. ***Both categories A and B are applicable (-15 points)***
d. ***Compliance with IBC 1018.5 and IMC 602 (0 points)***
e. ***Systems serving one story; or a central boiler/chiller system without ductwork connecting two or more stories (+5 points)***

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Automatic Fire Detection Section 1401.6.8

Points are awarded based on the smoke detection capability, location and operation of automatic fire detectors

- ***A. None***
- ***B. Existing smoke detectors in HVAC systems maintained to IFC standards***
- ***C. Smoke detectors in HVAC systems installed in accordance with requirements of new construction***
- ***D. Smoke detectors throughout all floor areas other than individual sleeping units, tenant spaces and dwelling units.***
- ***E. Smoke detectors installed throughout the fire area***

TABLE 1401.6.8
AUTOMATIC FIRE DETECTION VALUES

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-3, F, M, R, S-1	-10	-5	0	2	6	—
A-2	-25	-5	0	5	9	—
A-4, B, E, S-2	-4	-2	0	4	8	—
I-2	NP	NP	NP	4	5	2

Performance Compliance Method

Chapter14* - *Scoring Method Focus on Fire Life Safety

Evaluation – Fire Alarm Systems Section 1401.6.9

Points are awarded based on the capability of the fire alarm system in accordance with IBC 907

- ***A. None***
- ***B. Fire alarm system with manual fire alarm boxes (per IBC 907.3) and alarm notification appliances (per IBC 907.5.2)***
- ***C. Fire alarm system in accordance with IBC 907***
- ***D. Category C plus a required emergency/voice alarm communications system and a fire command station (per 403.4.5 & 911)***

TABLE 1401.6.9
FIRE ALARM SYSTEM VALUES

OCCUPANCY	CATEGORIES			
	a	b[a]	c	d
A-1, A-2, A-3, A-4, B, E, R	-10	-5	0	5
F, M, S	0	5	10	15
I-2	-4	1	2	5

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Smoke Control Section 1401.6.10

Points are awarded based on the ability for natural or mechanical venting, exhaust, or pressurization system to control the movement of smoke from a fire.

- ***a.*** ***None***
- ***b.*** ***Sprinkler system with readily operable exterior wall openings (or approved breakable windows) provided at 20 ft^2 per 50 linear ft of exterior wall***
- ***c.*** ***One enclosed exit stairway accessible from each occupied floor with operable exterior windows in addition to compliance with Category B.***
- ***d.*** ***One smokeproof enclosure with openings per Category B***
- ***e.*** ***Sprinkler system with approved mechanical smoke containment air-handling equipment on each floor***
- ***f.*** ***Each stairway is either: a smokeproof enclosure per IBC 1022.9; pressurized per IBC 909.20.5; or has operable exterior windows***

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Smoke Control Section 1401.6.10

Points are awarded based on the ability for natural or mechanical venting, exhaust, or pressurization system to control the movement of smoke from a fire.

TABLE 1401.6.10
SMOKE CONTROL VALUES

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-2, A-3	0	1	2	3	6	6
A-4, E	0	0	0	1	3	5
B, M, R	0	2[a]	3[a]	3[a]	3[a]	4[a]
F, S	0	2[a]	2[a]	3[a]	3[a]	3[a]
I-2	-4	0	0	0	3	0

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Means of Egress Section 1401.6.11

Points are awarded based on the egress capacity and number of exits available to the building occupants as stipulated by IBC Chapter 10.

TABLE 1401.6.11
MEANS OF EGRESS VALUES[a]

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1, A-2, A-3, A-4, E, I-2	-10	0	2	8	10
M	-3	0	1	2	4
B, F, S	-1	0	0	0	0
R	-3	0	0	0	0

Performance Compliance Method

Chapter14* - *Scoring Method Focus on Fire Life Safety

Evaluation – Means of Egress Section 1401.6.11

Points are awarded based on the egress capacity and number of exits available to the building occupants as stipulated by IBC Chapter 10.

- ***A. Compliance with minimum required means of egress capacity or number of exits achieved through the use of a fire escape per 605.3.1.2***
- ***B. Capacity of the means of egress complies with IBC 1004 and number of exits complies with IBC 1021***
- ***C. Capacity of the means of egress is equal to or greater than 125% of the required capacity and complies with the minimum dimensions of the IBC. The number of exits complies with IBC 1021***
- ***D. The number of exits exceeds the number required by IBC 1021 and are located at least the distance specified in IBC 1015.2***
- ***E. Meets both categories C and D***

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Dead Ends Section 1401.6.12

Points are awarded based on the length of

the exit travel path where occupants are

confined to a single path of travel

a. ***Dead end of 35' in non-sprinklered building or 70' in sprinklered building***
b. ***Dead end of 20'; or 50' in Group B (per IBC 1018.4 Exception 2)***
c. ***No dead ends; or ratio of length to width is less than 2.5:1***

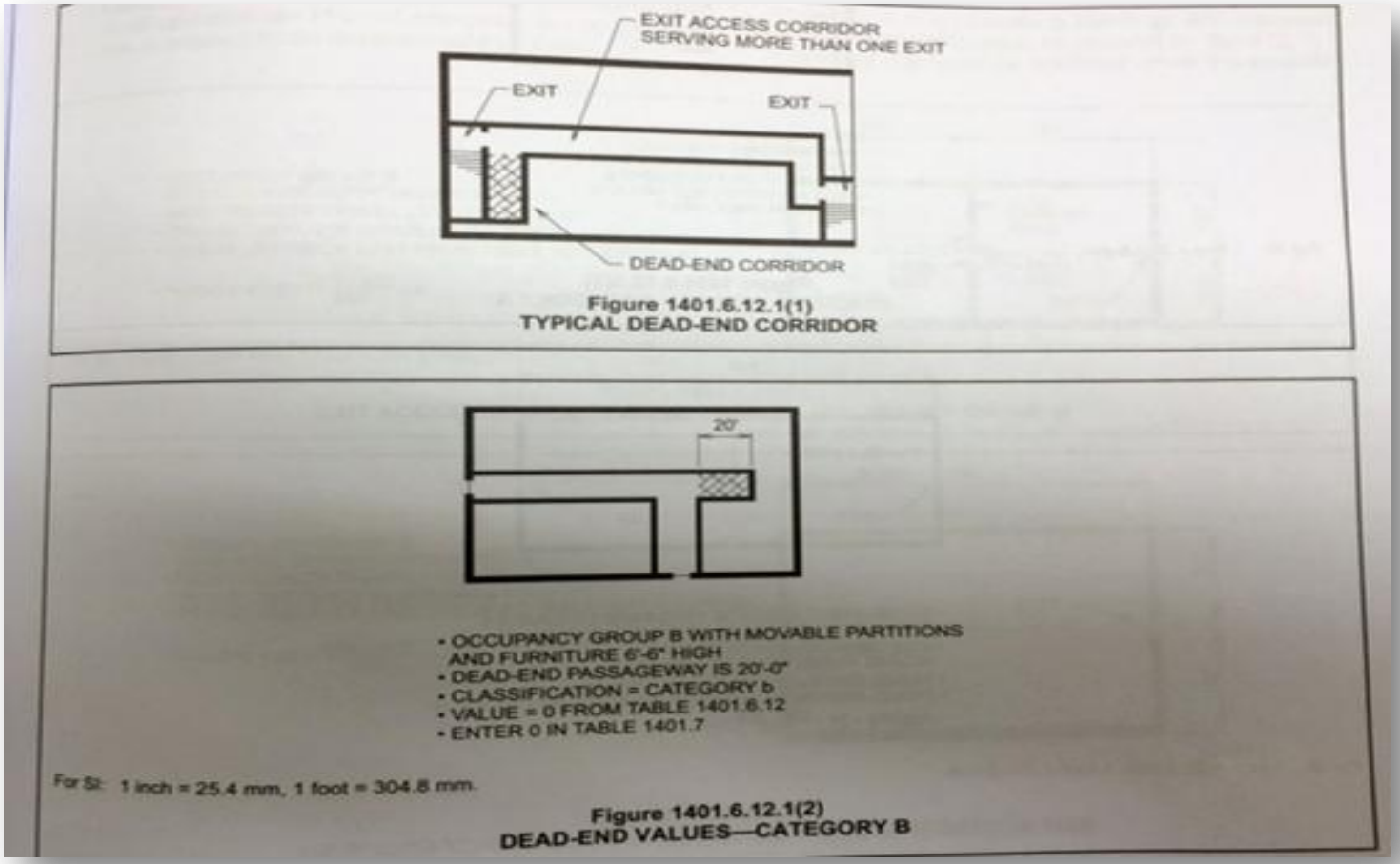
TABLE 1401.6.12
DEAD-END VALUES

OCCUPANCY	CATEGORIES[a]			
	a	b	c	d
A-1, A-3, A-4, B, F, M, R, S	-2	0	2	-4
A-2, E	-2	0	2	-4
I-2	-2	0	2	-6

Performance Compliance Method

Chapter14* - *Scoring Method Focus on Fire Life Safety

Evaluation – Dead Ends Section 1401.6.12



Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Travel Distance Section 1401.6.13

Points are awarded based on the length of the exit travel path to an approved exit. The maximum allowable distance is determined by IBC 1016.1

$$\text{Points} = 20 \times \frac{\text{Maximum allowable travel distance} - \text{Maximum actual travel distance}}{\text{Maximum allowable travel distance}}$$

(Equation 14-6)

$$\text{Points} = 20\left(\frac{200 \text{ feet} - 150 \text{ feet}}{200 \text{ feet}}\right)$$

$$= 5.0$$

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Elevator Controls Section 1401.6.14

Points are awarded based on the elevator control features available to the fire department on installed elevators.

a. ***No elevator***

b. ***Any elevator without Phase I and II recall***

c. ***All elevators with Phase I and II recall per IFC***

d. ***All meet Category C; or Category where permitted without recall; and at least one elevator that complies with new construction requirements serves all occupied floors***

TABLE 1401.6.14
ELEVATOR CONTROL VALUES

ELEVATOR TRAVEL	CATEGORIES			
	a	b	c	d
Less than 25 feet of travel above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-2	0	0	+2
Travel of 25 feet or more above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-4	NP	0	+4

For SI: 1 foot = 304.8 mm.
NP = Not permitted.

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Emergency Lighting Section 1401.6.15

Points are awarded based on the provided emergency lighting in the means of egress

a. ***Lighting and exits signs not provided with emergency power per IBC 2702***

b. ***Lighting and exits signs provided with emergency power per IBC 27023***

c. ***Lighting and exits signs provided with emergency power that provides protection in the event of power failure to the site or building***

TABLE 1401.6.15
MEANS-OF-EGRESS EMERGENCY LIGHTING VALUES

NUMBER OF EXITS REQUIRED BY SECTION 1015 OF THE *INTERNATIONAL BUILDING CODE*	CATEGORIES		
	a	b	c
Two or more exits	NP	0	4
Minimum of one exit	0	1	1

NP = Not permitted.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Mixed Occupancies Section 1401.6.16

Points are awarded based on the separation provided between different occupancies in the building. If there are no mixed occupancies, the value is zero.

a. ***Separated by a minimum 1 hour fire barriers and/or 1hour horizontal assemblies***

b. ***Separation between occupancies is in accordance with IBC 508.4***

c. ***Separations are not less than twice the required separation from IBC 508.4***

TABLE 1401.6.16
MIXED OCCUPANCY VALUES[a]

OCCUPANCY	CATEGORIES		
	a	b	c
A-1, A-2, R	-10	0	10
A-3, A-4, B, E, F, M, S	-5	0	5
I-2	NP	0	5

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Automatic Sprinklers Section 1401.6.17

Points are awarded based on the ability to suppress a fire based on the installation of automatic sprinklers per IBC 903.3.1.1.

Note: ***Sprinklers required by M.G.L. c. 148 26G are not considered required for this section.***

a. ***Sprinklers are required throughout; however, not provided or not adequate for the hazard protected per IBC 903***

b. ***Required in a portion of the building; however, not provided or not adequate for the hazard protected per IBC 903***

c. ***Not required and none are provided***

d. ***Required in a portion of the building, provided in compliance with code at time of construction, and maintained/supervised per IBC 903***

e. ***Required throughout and are provided per Chapter 9 of IBC***

f. ***Not required throughout but are provided per Chapter 9 of IBC***

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Automatic Sprinklers Section 1401.6.17

Points are awarded based on the ability to suppress a fire based on the installation of automatic sprinklers per IBC 903.3.1.1.

TABLE 1401.6.17
SPRINKLER SYSTEM VALUES

OCCUPANCY	CATEGORIES					
	a[a]	b[a]	c	d	e	f
A-1, A-3, F, M, R, S-1	-6	-3	0	2	4	6
A-2	-4	-2	0	1	2	4
A-4, B, E, S-2	-12	-6	0	3	6	12
I-2	NP	NP	NP	8	10	NP

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Standpipes Section 1401.6.18

Points are awarded based on the ability to initiate an attack on a Fire through the use of water provided by a standpipe system per IBC 905

a. ***Standpipes are required but are not provided or the design is not compliant with IBC 905.3***
b. ***Not required, not provided***
c. ***Required and provided per IBC 905***
d. ***Not required but provided per IBC 905***

TABLE 1401.6.18
STANDPIPE SYSTEM VALUES

OCCUPANCY	CATEGORIES			
	a[a]	b	c	d
A-1, A-3, F, M, R, S-1	-6	0	4	6
A-2	-4	0	2	4
A-4, B, E, S-2	-12	0	6	12
I-2	-2	0	1	2

a. This option cannot be taken if Category a or Category b in Section 1401.6.17 is used.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Accessory Occupancy Section 1401.6.19

Points are awarded based on the protection of incidental accessory occupancies per 508.2.5.

- ***Not including those that require suppression throughout the building (covered malls, high-rises, unlimited area buildings, etc)***
- ***If there are no specific occupancy areas in the building or floor being evaluated then the score is zero.***

TABLE 1401.6.19
INCIDENTAL USE AREA VALUES

PROTECTION REQUIRED BY TABLE 509 OF THE *INTERNATIONAL BUILDING CODE*	PROTECTION PROVIDED						
	None	1 hour	AS	AS with CRS	1 hour and AS	2 hours	2 hours and AS
2 hours and AS	-4	-3	-2	-2	-1	-2	0
2 hours, or 1 hour and AS	-3	-2	-1	-1	0	0	0
1 hour and AS	-3	-2	-1	-1	0	-1	0
1 hour	-1	0	-1	-1	0	0	0
1 hour, or AS with CRS	-1	0	-1	-1	0	0	0
AS with CRS	-1	-1	-1	-1	0	-1	0
1 hour or AS	-1	0	0	0	0	0	0

AS = Automatic sprinkler system.
CRS = Construction capable of resisting the passage of smoke (see IBC Section 509.4.2 of the *International Building Code*).
Note: For Table 1401.7, see page 75 of the code or page 14-36 of this volume.

Performance Compliance Method

Evaluation – Building Score Section 1401.7

TABLE 1401.7
SUMMARY SHEET-BUILDING CODE

Existing occupancy _____
Year building was constructed _____
Type of construction _____
Percentage of open perimeter increase _____%
Completely suppressed: Yes _____ No _____

Compartmentation: Yes _____ No _____
Fire-resistance rating of vertical opening enclosures _____
Type of HVAC system _____
Automatic fire detection: Yes _____ No _____
Fire alarm system: Yes _____ No _____
Smoke control: Yes _____ No _____
Adequate exit routes: Yes _____ No _____
Maximum exit access travel distance _____
Means of egress emergency lighting: Yes _____ No _____
Standpipes Yes _____ No _____
Incidental use Yes _____ No _____
Smoke compartmentation less than 22,500 sq. feet (2092 m^2) Yes _____ No _____

Proposed occupancy _____
Number of stories _____ Height in feet _____
Area per floor _____

Corridor wall rating _____
Type: _____
Required door closers: Yes _____ No _____
, serving number of floors _____
Type and location _____
Type _____
Type _____
Dead ends: _____ Yes _____ No _____
Elevator controls: Yes _____ No _____
Mixed occupancies: Yes _____ No _____
Patient ability for self-preservation _____
Patient concentration _____

Attendant-to-patient ratio _____

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1401.6.1 Building Height 1401.6.2 Building Area 1401.6.3 Compartmentation			
1401.6.4 Tenant and Dwelling Unit Separations 1401.6.5 Corridor Walls 1401.6.6 Vertical Openings			
1401.6.7 HVAC Systems 1401.6.8 Automatic Fire Detection 1401.6.9 Fire Alarm System			
1401.6.10 Smoke control 1401.6.11 Means of Egress 1401.6.12 Dead ends	* * * * * * * * * * * *		
1401.6.13 Maximum Exit Access Travel Distance 1401.6.14 Elevator Control 1401.6.15 Means of Egress Emergency Lighting	* * * * * * * *		
1401.6.16 Mixed Occupancies 1401.6.17 Automatic Sprinklers 1401.6.18 Standpipes 1401.6.19 Incidental Use 1401.6.20 Smoke compartmentation 1401.6.21.1 Patient ability for self-preservation 1401.6.21.2 Patient concentration 1401.6.21.3 Attendant-to-patient Ratio	* * * * * * * * * * * *	* * * * ÷2 =	
Building score—total value			

* * * *No applicable value to be inserted.

Performance Compliance Method

***Chapter14* - Scoring Method Focus on Fire Life Safety**

Evaluation – Building Score Section 1401.7

TABLE 1401.8
MANDATORY SAFETY SCORES[a]

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-1	20	31	31
A-2	21	32	32
A-3	22	33	33
A-4, E	29	40	40
B	30	40	40
F	24	34	34
I-2	19	34	34
M	23	40	40
R	21	38	38
S-1	19	29	29
S-2	29	39	39

a. MFS = Mandatory Fire Safety.
MME = Mandatory Means of Egress.
MGS = Mandatory General Safety.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Building Score Section 1401.7

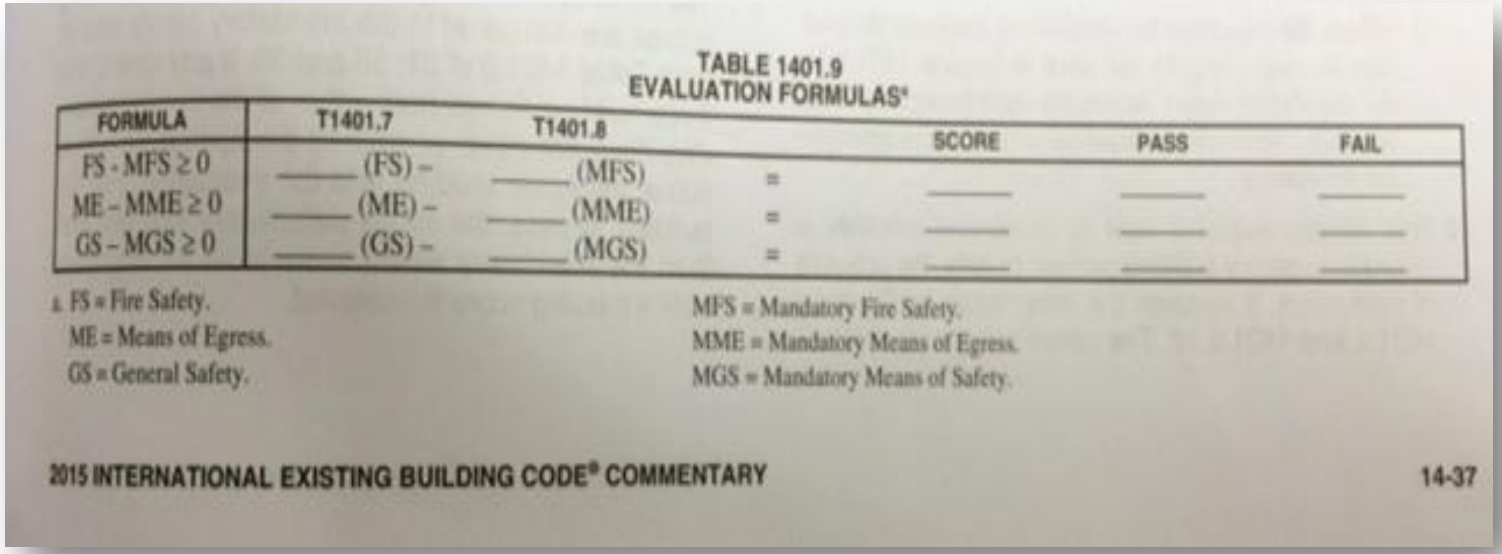


TABLE 1401.9
EVALUATION FORMULAS[a]

FORMULA	T1401.7	T1401.8		SCORE	PASS	FAIL
FS - MFS ≥ 0	_____ (FS) –	_____ (MFS)	=	_____	_____	_____
ME - MME ≥ 0	_____ (ME) –	_____ (MME)	=	_____	_____	_____
GS - MGS ≥ 0	_____ (GS) –	_____ (MGS)	=	_____	_____	_____

a. FS = Fire Safety.
ME = Means of Egress.
GS = General Safety.

MFS = Mandatory Fire Safety.
MME = Mandatory Means of Egress.
MGS = Mandatory Means of Safety.

2015 INTERNATIONAL EXISTING BUILDING CODE® COMMENTARY 14-37

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Building Score Section 1401.7

TABLE 1401.7
SUMMARY SHEET-BUILDING CODE

Existing occupancy: Business Use
Year building was constructed: 1993
Type of construction: IIA
Percentage of open perimeter increase: 68 %
Completely suppressed: Yes ____ No ✓
Compartmentation: Yes ____ No ✓
Fire-resistance rating of vertical opening enclosures: 1 hour
Type of HVAC system: Carrier Infinity Series
Automatic fire detection: Yes ✓ No ____
Fire alarm system: Yes ✓ No ____
Smoke control: Yes ✓ No ____
Adequate exit routes: Yes ✓ No ____
Maximum exit access travel distance: 150
Means of egress emergency lighting: Yes ✓ No ____
Standpipes: Yes ____ No ✓
Incidental use: Yes ✓ No ____
Smoke compartmentation less than 22,500 sq. feet (2092 m²): Yes ____ No ✓

Proposed occupancy: Business Use
Number of stories: 5 Height in feet: 60
Area per floor: 90,000
Corridor wall rating: 1 hour
Type: UL G556
Required door closers: Yes ✓ No ____
Type ____
Type ____
Type ____
Dead ____
Eleva ____
Mixe ____
Patier ____
Patier ____
Attendant-to-patient ratio: N/A

Needs Work To Make the Renovated Building Comply

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1401.6.1 Building Height	0	0	0
1401.6.2 Building Area	19.17	19.17	19.17
1401.6.3 Compartmentation	0	0	0
1401.6.4 Tenant and Dwelling Unit Separations	-4	-4	-4
1401.6.5 Corridor Walls	0	0	0
1401.6.6 Vertical Openings	2.2	2.2	2.2
1401.6.7 HVAC Systems	-10	-10	-10
1401.6.8 Automatic Fire Detection	0	0	0
1401.6.9 Fire Alarm System	0	0	0
1401.6.10 Smoke control	****	0	0
1401.6.11 Means of Egress	****	0	0
1401.6.12 Dead ends	****	2	2
1401.6.13 Maximum Exit Access Travel Distance	****	5	5
1401.6.14 Elevator Control	0	0	0
1401.6.15 Means of Egress Emergency Lighting	****	0	0
1401.6.16 Mixed Occupancies	0	****	0
1401.6.17 Automatic Sprinklers	0	÷2 =	0
1401.6.18 Standpipes	0	0	0
1401.6.19 Incidental Use	0	0	0
1401.6.20 Smoke compartmentation	0	0	0
1401.6.21.1 Patient ability for self-preservation	****	—	—
1401.6.21.2 Patient concentration	****	—	—
1401.6.21.3 Attendant-to-patient Ratio	****	—	—
Building score—total value	7.37	16.37	23.17

**** No applicable value to be inserted.

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Building Score Section 1401.7

TABLE 1401.9
EVALUATION FORMULAS[a]

FORMULA	T1401.7	T1401.8		SCORE	PASS	FAIL
FS - MFS ≥ 0	7.37 (FS) -	30 (MFS)	=	-22.63		✓
ME - MME ≥ 0	16.37 (ME) -	40 (MME)	=	-23.63		✓
GS - MGS ≥ 0	23.17 (GS) -	40 (MGS)	=	-16.83		✓

a. FS = Fire Safety.
ME = Means of Egress.
GS = General Safety.
MFS = Mandatory Fire Safety.
MME = Mandatory Means of Egress.
MGS = Mandatory Means of Safety.

Needs Work to Make the Renovated Building Comply

Performance Compliance Method

Chapter14 - Scoring Method Focus on Fire Life Safety

Evaluation – Building Score Section 1401.7

Conclusion:

The building is acceptable; all of the final safety scores are zero or greater. Each category must individually have a building score equal to or greater than the respective mandatory safety score for the building to pass the overall evaluation.

Table 1401.9
EVALUATION FORMULAS[a]

Formula	Table 1401.7	Table 1401.8	Score	Pass	Fail
FS-MFS ≥ 0	23 (FS)	- 23 (MFS) =	0	X	—
ME-MME ≥ 0	41 (ME)	- 40 (MME) =	1	X	—
GS-MGS ≥ 0	42 (GS)	- 40 (MGS) =	1	X	—

Note a.
FS = Fire Safety
ME = Means of Egress
GS = General Safety
MFS = Mandatory Fire Safety
MME = Mandatory Means of Egress
MGS = Mandatory General Safety

Figure 1401.9
EXAMPLE OF EVALUATION FORMULAS

Change of Occupancy

Chapter 10

CHANGE OF OCCUPANCY. A change in the use of the building or a portion of a building. A change of occupancy shall include 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.

303.4 Assembly Group A-3. Group A-3 occupancy includes assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades
Art galleries
Bowling alleys
Community halls
Courtrooms
Dance halls (not including food or drink consumption)
Exhibition halls
Funeral parlors
Gymnasiums (without spectator seating)
Indoor *swimming pools* (without spectator seating)
Indoor tennis courts (without spectator seating)
Lecture halls
Libraries
Museums
Places of religious worship
Pool and billiard parlors
Waiting areas in transportation terminals

Change of Occupancy
Chapter 10

- As a general rule, when a change of occupancy classification occurs, the requirements of Chapter 9 for Level 3 Alterations apply along with provisions of IEBC Section 1012. However, there are exceptions as identified in 1012.4 dealing with lesser hazard uses.

1012.4 Means of egress, general. Hazard categories in regard to life safety and means of egress shall be in accordance with Table 1012.4.

TABLE 1012.4
MEANS OF EGRESS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	I-2, I-3, I-4
3	A, E, I-1, M, R-1, R-2, R-4
4	B, F-1, R-3, S-1
5 (Lowest Hazard)	F-2, S-2, U

Additions

Chapter 11

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

SECTION 1101
GENERAL

1101.1 Scope. An *addition* to a building or structure shall comply with the *International Codes* 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 shall comply with this code.

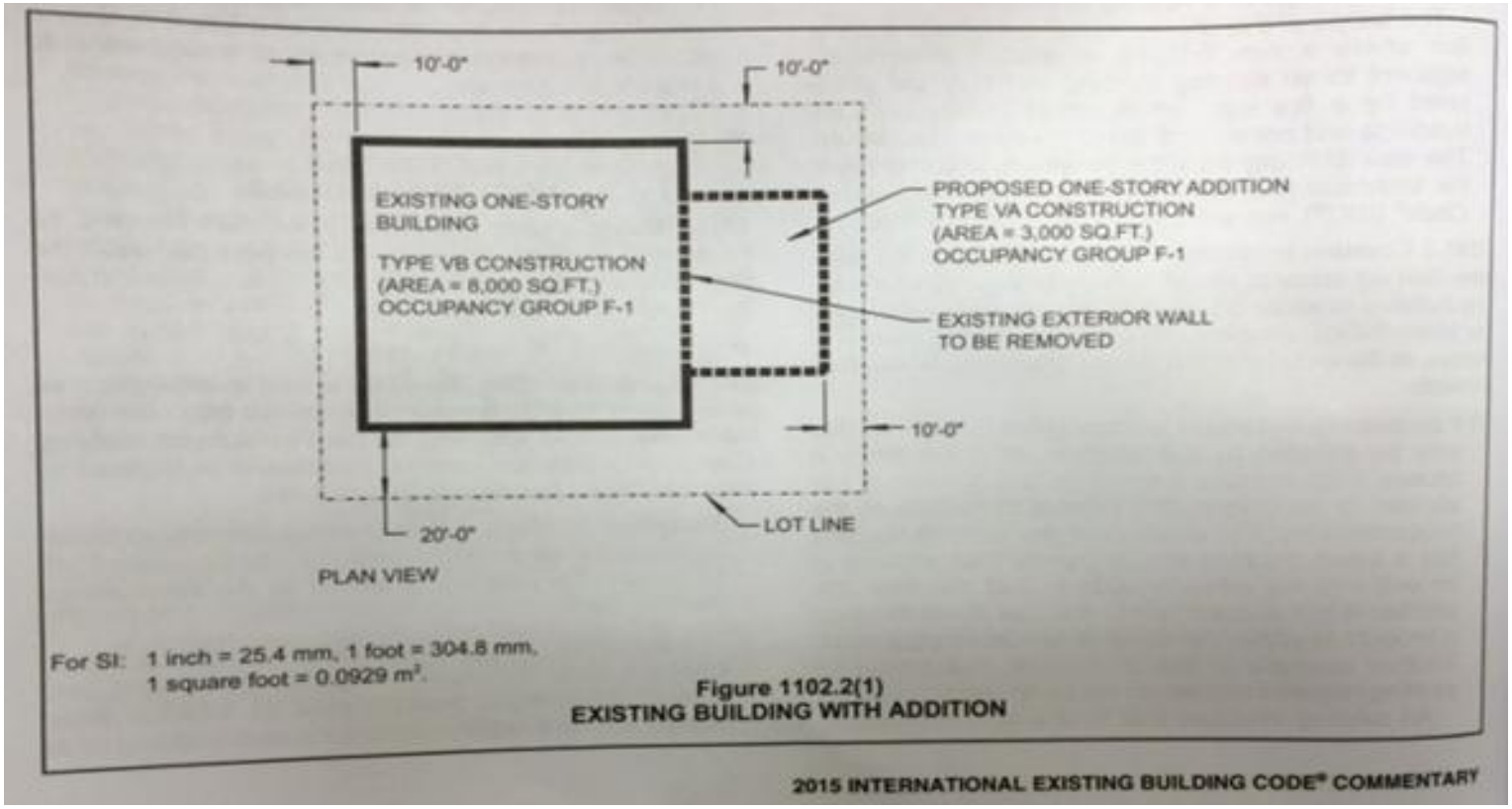
1101.2 Creation or extension of nonconformity. An *addition* shall not create or extend any nonconformity in the *existing building* to which the *addition* is being made with regard to accessibility, structural strength, fire safety, means of egress, or the capacity of mechanical, plumbing, or electrical systems.

1101.3 Other work. Any *repair* or *alteration* work within an *existing building* to which an *addition* is being made shall comply with the applicable requirements for the work as classified in Chapter 5.

Additions

Chapter 11

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.



Additions

Chapter 11

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

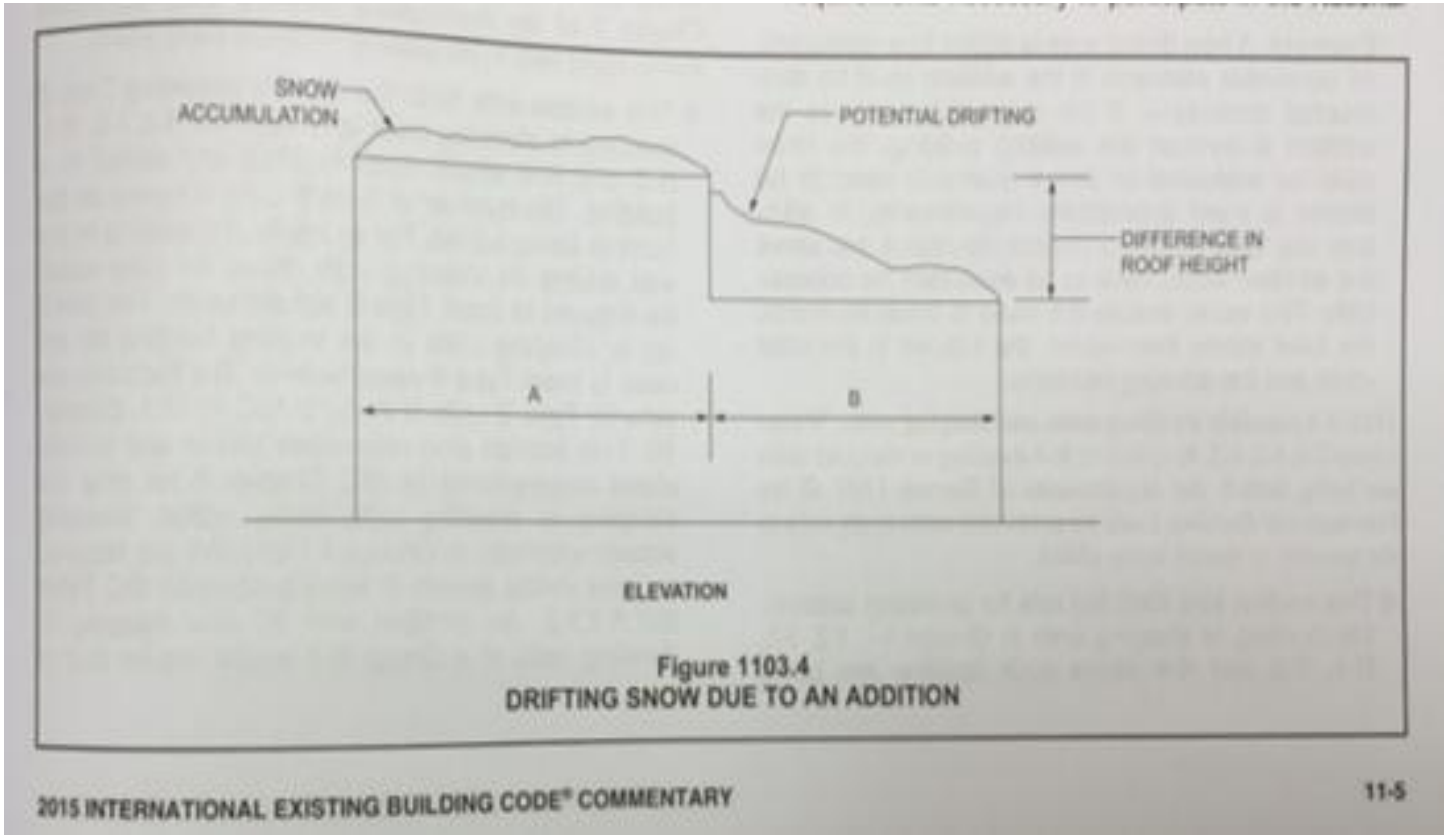
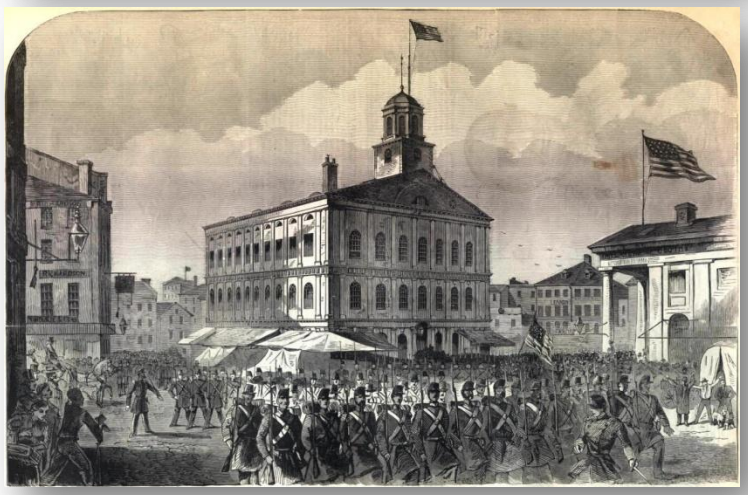


Figure 1103.4
DRIFTING SNOW DUE TO AN ADDITION

Historic Buildings

Chapter 12

- ***Defined as:***
- ***Buildings that are listed in or eligible for listing in the National or State Register of Historic Places, or designated as historic under an appropriate state or local law.***
- ***Owners are not obligated to use the provisions of this chapter.***
- ***An R-3 building that is also used for Group A, B or M purposes (tours, exhibits, etc.), or for house museums less than 3,000 sq ft - the code official may allow it to be classified as a B occupancy (1201.3).***



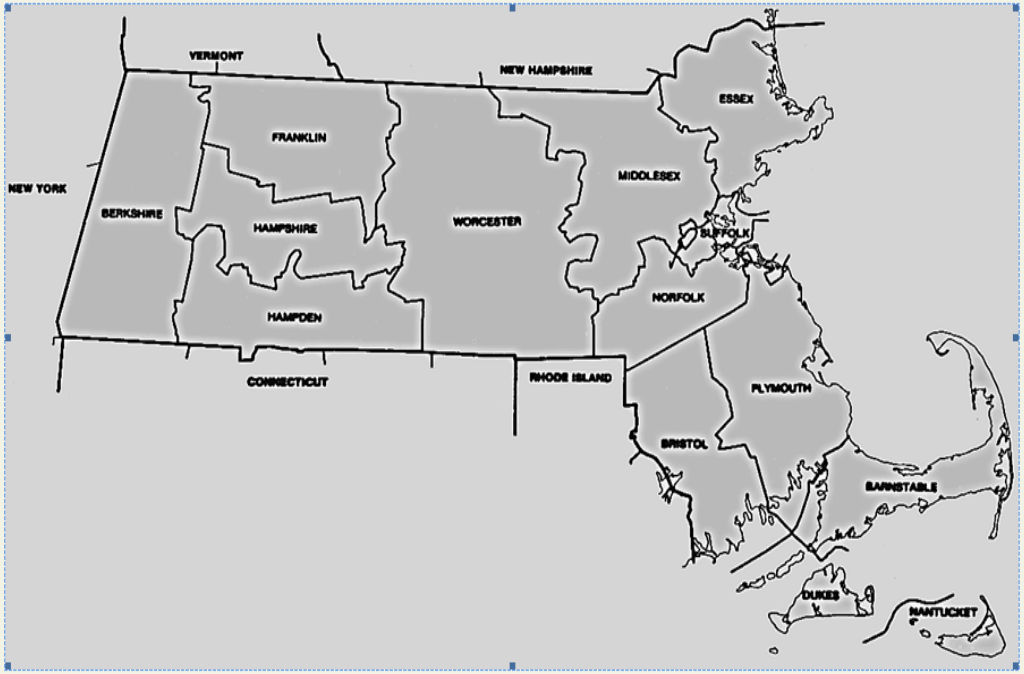
Historic Buildings

Chapter 12

http://www.nationalregisterofhistoricplaces.com/ma/state.html

MASSACHUSETTS - Select a County

Barnstable Berkshire Bristol Dukes Essex Franklin Hampden Hampshire Middlesex Nantucket Norfolk Plymouth Suffolk Worcester



Historic Buildings

Chapter 12

- ***Repairs*** *to any portion of the historic building or structure are permitted to be with original or like materials and original methods of construction (1202.1).*
- ***Replacement*** *of existing or missing features with original materials is permitted.*
- ***Replacement*** *of individual components of a building system can be replaced in kind without requiring the system to comply with the code for new construction (1202.5).*
- ***Distinct fire hazard*** *may require the installation of an automatic fire-extinguishing system (1203.2).*
- ***Existing egress components*** *are permitted as long as the code official deems they are safe of egress (1203.3).*

Historic Buildings

Chapter 12

- ***In buildings 3 stories or less, exit stairways*** *must be enclosed to limit the spread of smoke. Enclosures do not require a fireresistance rating (1203.6).*
- ***Grand stairways*** *do not need to comply with the handrail and guard requirements as long as they are not structurally dangerous (1203.9).*
- ***Manual fire extinguishing equipment and manual pull stations*** *are required for house museums in all use groups other than R-3 and R-4 (1203.12).*
- ***Fire extinguishers*** *are not required if the building is equipped with a sprinkler system.*
- ***Fire alarm systems*** *are required in all house museums as specified in Section 1203.12(2).*
- ***Smoke detection equipment*** *is only required in R-1,-2,-3 when equipped with a sprinkler system.*

Historic Buildings

Chapter 12

- ***Change of occupancy** in an historic building shall comply with the appropriate provisions of Chapter 9 unless otherwise noted. (1205.1)*

Exceptions:

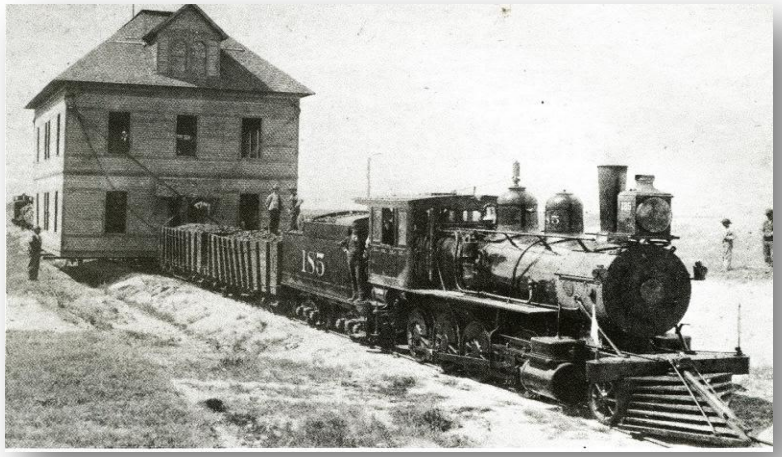
- *Building area limits are allowed to be exceeded by 20% for change of occupancy (1205.2).*
- *Occupancy separation of 1 hour can be omitted if equipped with an approved automatic sprinkler system (1205.4)*
- *For buildings less than 3,000 sq ft existing conditions are permitted to remain at all stairs and rails (1205.11)*

Relocated or Moved Buildings

Chapter 13

- ***The building must be located on the lot in accordance with the IBC or IRC as applicable, local zoning, etc.***

- ***Foundation, connections thereto, new systems shall comply with the IBC or IRC as applicable, local zoning, etc.***



Construction Safeguards

Chapter 15

SECTION 1501
GENERAL

[BG] 1501.1 Scope. The provisions of this chapter shall govern safety during construction that is under the jurisdiction of this code and the protection of adjacent public and private properties.

Section 1501 – Includes (among other things):

- **Storage and Placement of Materials**
- **Removal of Waste Materials**
- **Fire Safety During Construction**
- **Protection of Pedestrians**
- **Barriers**

Construction Safeguards

Chapter 15

Section 1502 – Protection of Adjoining Property

Section 1503 – Temporary Use of Street, Alleys and Public Property

Section 1504 – Fire Extinguishers

Section 1505 – Means of Egress

Section 1506 – Standpipe Systems

Section 1507 – Automatic Sprinkler System

Section 1508 – Accessibility

Section 1509 – Protection of Adjoining Property

Construction Safeguards

Chapter 15

Section 1502 – Protection of Adjoining Property

Section 1503 – Temporary Use of Street, Alleys and Public Property

Section 1504 – Fire Extinguishers

Section 1505 – Means of Egress

Section 1506 – Standpipe Systems

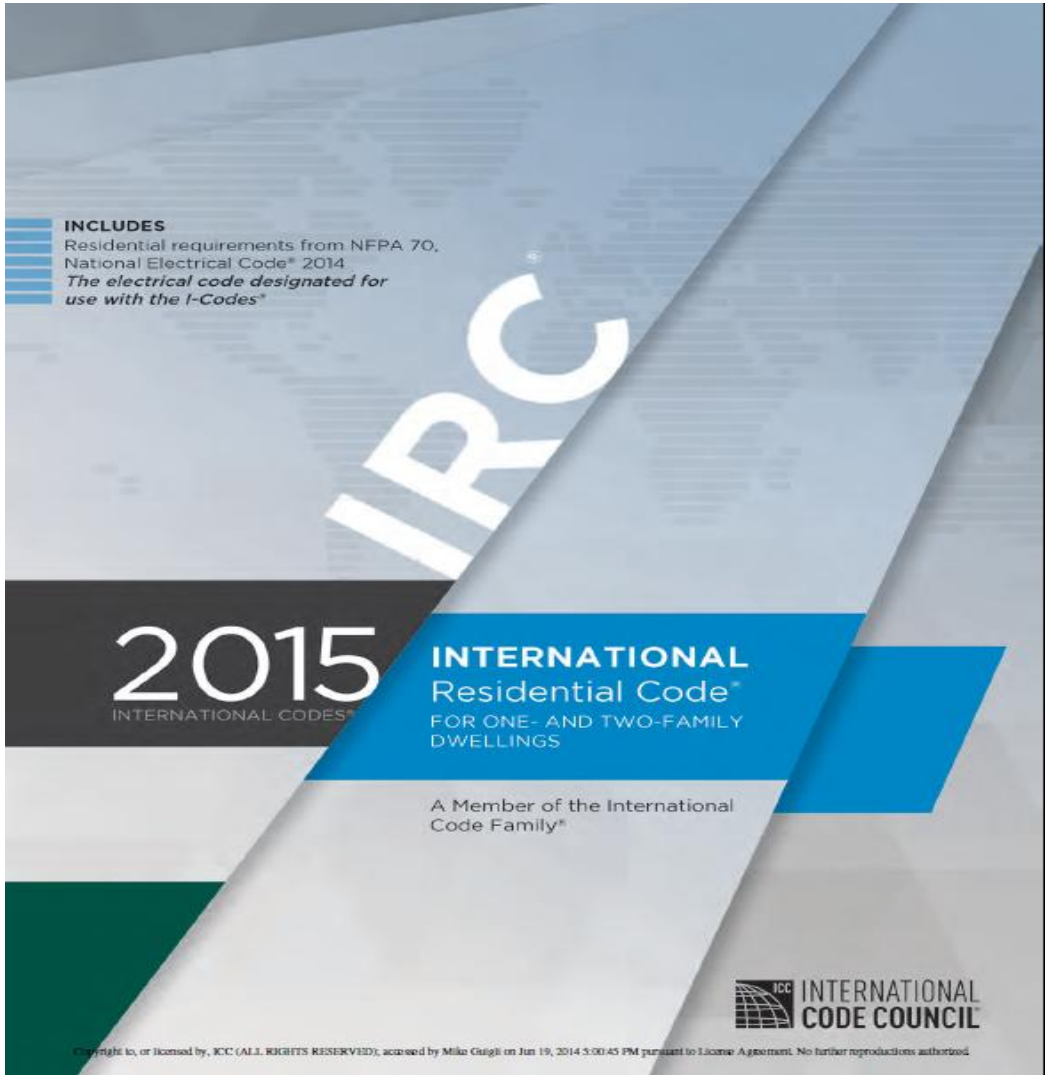
Section 1507 – Automatic Sprinkler System

Section 1508 – Accessibility

Section 1509 – Protection of Adjoining Property

Renovating Existing Single- and Two-Family Dwellings

IRC Appendix J



Renovating Existing Single- and Two-Family Dwellings
IRC Appendix J

- **APPENDIX J: EXISTING BUILDINGS AND STRUCTURES (Adopted as amended)**

  http://www.mass.gov/eopss/docs/dps/buildingcode/inf4/bbrs2016-01-15-rescodepublic-comment.pdf
- **AJ101.1 Revise the section as follows:**
- **AJ101.1 General. The purpose of these provisions is to encourage the continued** use or reuse of legally existing buildings and structures. These provisions are intended to permit work in existing buildings that is consistent with the purpose of this code. Compliance with these provisions shall be deemed to meet the requirements of this code.
- Features of existing construction which do not meet the requirements of this code for new construction shall be presumed to have met the regulations, codes or laws in effect at the time of construction or alteration and, if so, shall be deemed to be existing nonconforming. Unless stated otherwise, nothing in this chapter shall require the upgrading or replacement of any existing nonconforming feature or component of an existing building, provided the feature, component or system is in serviceable condition. Components or features of an existing building which, in the opinion of the *building official, are dangerous, unsafe, damaged,* significantly deteriorated or which otherwise present a threat to occupants or to public safety shall be remediated in accordance with this code. Any new building system or portion thereof shall conform to this code for new construction to the fullest extent practicable. However, individual components of an existing building system may be repaired or replaced without requiring that system to comply fully with this code unless specifically required by this appendix.
- **AJ102.1 General. Regardless of the category of work being performed, the work** shall not cause the structure to become unsafe or adversely affect the performance of the building; shall not cause a system regulated by this code to become unsafe, hazardous, insanitary or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously *approved alternative arrangements than it was before the work was* undertaken.

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SECTION AJ104
EVALUATION OF AN EXISTING BUILDING

AJ104.1 General. The *building official* shall have the authority to require an existing building to be investigated and evaluated by a registered *design professional* in the case of proposed reconstruction of any portion of a building. The evaluation shall determine the existence of any potential nonconformities to these provisions, and shall provide a basis for determining the impact of the proposed changes on the performance of the building. The evaluation shall use the following sources of information, as applicable:

1. Available documentation of the existing building.
    - 1.1. Field surveys.
    - 1.2. Tests (nondestructive and destructive).
    - 1.3. Laboratory analysis.

Exception: Detached one- or two-family dwellings that are not irregular buildings under Section R301.2.2.2.5 and are not undergoing an extensive reconstruction shall not be required to be evaluated.

SECTION AJ105
PERMIT

AJ105.1 Identification of work area. The work area shall be clearly identified on the *permits* issued under these provisions.

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R301.2.2.2.5 Irregular buildings. The seismic provisions of this code shall not be used for irregular structures located in Seismic Design Categories C, D_0, D_1 and D_2. Irregular portions of structures shall be designed in accordance with accepted engineering practice to the extent the irregular features affect the performance of the remaining structural system. Where the forces associated with the irregularity are resisted by a structural system designed in accordance with accepted engineering practice, design of the remainder of the building shall be permitted using the provisions of the code. A building or portion of a building shall be considered to be irregular where one or more of the following conditions occur:

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- 2015 IRC Appendix J is comprised of only 4 pages at the back of the book (beginning on page 829).
- There are 4½ pages of proposed Massachusetts amendments posted on the DPS website (beginning on page 93).
- http://www.mass.gov/eopss/docs/dps/buildingcode/inf4/bbrs2016-01-15-rescodepublic-comment.pdf
- Many of the IRC provisions address how to evaluate and plan for renovations.
- Some are specific to:

REPAIR. The patching, restoration or minor replacement of materials, elements, components, *equipment* or fixtures for the purposes of maintaining those materials, elements, components, *equipment* or fixtures in good or sound condition.

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- Many of the IRC provisions address how to evaluate and plan for renovations.
- Some are specific to:

RENOVATION. The change, strengthening or *addition* of load-bearing elements; or the refinishing, replacement, bracing, strengthening, upgrading or extensive repair of existing materials, elements, components, *equipment* or fixtures. Renovation does not involve reconfiguration of spaces. Interior and exterior painting are not considered refinishing for purposes of this definition, and are not renovation.

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- Many of the IRC provisions address how to evaluate and plan for renovations.
- Some are specific to:

ALTERATION. The reconfiguration of any space; the *addition* or elimination of any door or window; the reconfiguration or extension of any system; or the installation of any additional *equipment*.

WORK AREA. That portion of a building affected by any renovation, *alteration* or reconstruction work as initially intended by the owner and indicated as such in the *permit*. Work area excludes other portions of the building where incidental work entailed by the intended work must be performed, and portions of the building where work not initially intended by the owner is specifically required by these provisions for a renovation, *alteration* or reconstruction.

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- Many of the IRC provisions address how to evaluate and plan for renovations.
- Some are specific to:

RECONSTRUCTION. The reconfiguration of a space that affects an exit, a renovation or *alteration* where the work area is not permitted to be occupied because existing means-of-egress and fire protection systems, or their equivalent, are not in place or continuously maintained; or there are extensive *alterations* as defined in Section AJ501.3.

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- Many of the IRC provisions address how to evaluate and plan for renovations.
- Some are specific to:

AJ501.3 Extensive alterations. Where the total area of all of the work areas included in an *alteration* exceeds 50 percent of the area of the *dwelling unit*, the work shall be considered to be a reconstruction and shall comply with the requirements of these provisions for reconstruction work.

Exception: Work areas in which the *alteration* work is exclusively plumbing, mechanical or electrical shall not be included in the computation of the total area of all work areas.

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- Massachusetts has revised some requirements pertinent to:
  - **AJ102.3 Revise the section as follows:**
  - **AJ102.3 Smoke, Carbon Monoxide and Heat protection.** Smoke, carbon monoxide and heat protection shall be provided when required by this section and designed, located and installed in accordance with the provisions for new construction (see sections R314, R314.5, and R315).
  - **AJ102.3.1 through AJ102.3.3 Add the subsections as follows:**
  - **AJ102.3.1 Adding or creating one or more sleeping rooms.**
  - 1. **Single family dwelling. When one or more sleeping rooms are added** or created to an existing dwelling, the entire dwelling shall be provided with smoke, heat and carbon monoxide protection.
  - 2. **Two-family dwelling. When one or more sleeping rooms are added** or created to one *dwelling unit that unit shall be provided with smoke,* heat and carbon monoxide protection detectors. When sleeping rooms are added or created to both units the entire building shall be provided with smoke, heat and carbon monoxide protection.
  - 3. **Townhouses dwelling unit. When one or more sleeping rooms are** added or created to an existing *dwelling unit, the entire unit shall be* provided with smoke, heat and carbon monoxide protection.

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- Massachusetts has revised some requirements pertinent to:

- **AJ102.3.2 Complete reconstruction.** If a *dwelling or townhouse building* undergoes reconstruction such that more than 50% of walls and ceilings are open to framing, then the entire existing building shall be provided with smoke, heat and carbon monoxide protection.
- **AJ102.3.3 Adding an attached garage.** If a garage is created under or attached to an existing *dwelling unit, a heat detector shall be provided in the garage, in* accordance with R314.8.
- **AJ102.7AJ102.7.1 Documentation of Compliance Alternatives.** The *building official* shall ensure that the BBRS is provided with information regarding the any and all compliance alternatives accepted by the *building official within two (2) weeks of* acceptance.
- **AJ102.10 through AJ102.14 Add sections, and associated subsections, as follows:**
- **AJ102.10 Unlined Chimneys. Where new HVAC appliances are connected to an** unlined chimney, the chimney lining requirements of the Board of State Examiners of Plumbers and Gas Fitters regulations at 248 CMR or the Board of Fire Prevention regulations at 527 CMR, as applicable, and those of the appliance manufacturer shall be satisfied. If the appliance is a solid fuel-burning appliance, the chimney shall be relined to satisfy requirements both of the code for new construction and those of the manufacturer, as applicable.

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- Massachusetts has revised some requirements pertinent to:
- **AJ102.10 through AJ102.14 Add sections, and associated subsections, as follows:**
- **AJ102.11 Latent Conditions. When latent conditions are observed and which are** determined by the licensed construction supervisor, the owner or the *building official to be dangerous or unsafe, or when a component or system is determined* to be unserviceable, said conditions shall be corrected in accordance with applicable provisions of this code. A building *permit shall be obtained or the* building *permit shall be amended in accordance with the provisions of Section* R105 in order to reflect the necessary required work and the approval shall be obtained from the *building official prior to commencement of the corrections.*
- **Exception.** If the public safety so warrants, the building permittable corrective actions are permitted to be made prior to amending the building *permit application, providing that the building official is notified in* writing within 24 hours of actions taken pursuant to this exception. This exception shall not be construed as to authorize constructive approval nor set aside the requirements to amend the *permit application, nor shall the* authority of the *building official to enforce this code be abridged. Such* corrective actions shall be documented by the construction supervisor or the owner and submitted to the *building official within 48 hours of the* completion of the action under this exception. Such corrective work shall not be concealed until the *building official has inspected and approved the* work.

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- Massachusetts has revised some requirements pertinent to:

- **AJ401.2.1 Add the subsection as follows:**
- **AJ401.2.1 Emergency Escape and Rescue Windows. For one- and two-family** dwellings and townhouses of no more than three stories in height, all emergency escape windows from sleeping rooms shall have a net clear opening of 3.3 square feet (0.307 m2). The minimum net clear opening shall be 20 inches by 24 inches (508 mm by 610 mm) in either direction except that windows in sleeping rooms of existing dwellings which do not conform to these requirements may be replaced without conforming to these dimensional requirements, provided that the windows do not significantly reduce the existing opening size.
- **Exception. Replacement windows utilized as emergency escape and** rescue windows, other than double-hung windows, shall generally conform to the requirements of this section without conforming to the cited dimensional requirements, provided that such replacement windows do not significantly reduce the existing opening size.

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- Massachusetts has revised some requirements pertinent to:

- **AJ401.4 Replace the section as follows:**
- **AJ401.4 Structural. Unreinforced masonry townhouse buildings shall have** parapet bracing and wall anchors installed at the roofline whenever a reroofing *permit is issued if required by 780 CMR 34.00: Existing Structures. Such parapet* bracing and wall anchors shall be of an *approved design. Where renovations may* decrease the structural performance of the existing building, such proposed activities shall be evaluated by a *registered design professional for adequacy,* prior to such actual structural renovation.
- **AJ501.1 Revise the section as follows:**
- **AJ501.1** Newly constructed elements. Additions, newly constructed elements, components and systems shall comply with the requirements of this code.
- **Exceptions:**
- 1. Operable windows may be added without requiring compliance with the light and *ventilation requirements of Section R303.*
- 2. Newly installed electrical *equipment shall comply with the* requirements of Section AJ501.5.

Department of Public Safety

Acknowledgement

Portions of this presentation are derived from the International Code Council's, ***International Existing Building Code and Commentary*** ®, and ***International Building Code and Commentary*** ®, which are used with kind permission of the ICC as well as public domain documents acquired from the internet.

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THANK YOU!