

The logo consists of the letters 'RWS' in white, bold, sans-serif font, set against a dark blue square background.

**R.W. Sullivan Engineering**

HVAC . Electrical . Plumbing . FP . Code

# Massachusetts State Building Code 8<sup>th</sup> Edition

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R.W. Sullivan Engineering (RWS) was established in 1945 and currently has 90 employees.

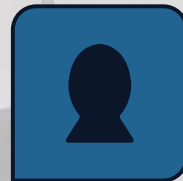
RWS is a full service engineering firm offering integrated services in the following disciplines:



HVAC



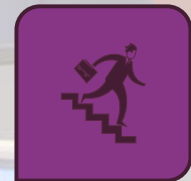
Electrical



Plumbing



Fire Protection



Code

# R.W. Sullivan Engineering

## Code Group

### *Comprehensive Code Services*

- Building, Fire, Life Safety, Accessibility
- Plan Review
- Existing Building Surveys
- Variances and Appeals
- National and International Experience

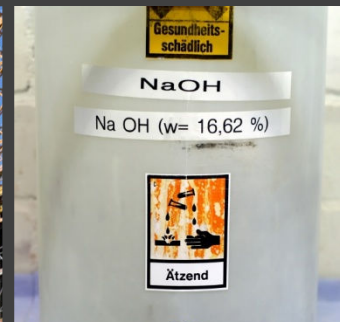
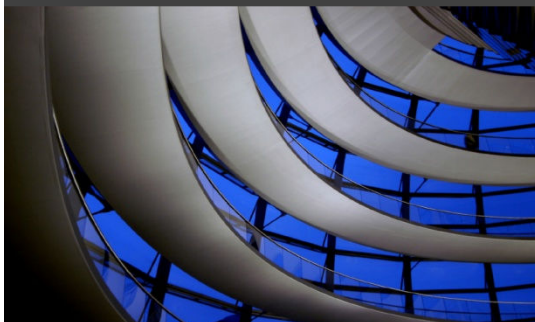


# R.W. Sullivan Engineering

## Code Group

### *Beyond the Code*

- Revit
- Sustainability and LEED
- Atrium Fire/Smoke and Egress Modeling
- Hazardous Materials
- Structural Fire Resistance



# Agenda

- Applicable codes in New England
- Status of 8<sup>th</sup> edition
- Overview of the major changes
  - New Construction – 2009 Int. Building Code
  - Existing Buildings – 2009 Int. Existing Building Code



# Applicable Codes in New England

State	Building	Plumbing	Mechanical	Energy	Misc
Connecticut	2003 IBC*	2003 IPC*	2003 IMC*	2006 IECC*	2005 NFPA 70* 2003 NFPA 101 <sup>†</sup>
Maine <sup>◇</sup>	2009 IBC	Maine Plumbing Code	2009 IMC	2009 IECC	2009 NFPA 101 for Misc Egress
Massachusetts	2009 IBC*	248 CMR	2009 IMC	2009 IECC*	2011 NFPA 70* 521 CMR (Access.) 527 CMR (Fire)
New Hampshire	2009 IBC*	2009 IPC*	2009 IMC*	2009 IECC*	2009 NFPA 101* 2008 NFPA 70
Rhode Island	2009 IBC*	2009 IPC*	2009 IMC*	2009 IECC*	2008 NFPA 70* 2003 NFPA 101
Vermont	2006 IBC*	2006 IPC*	2006 IMC*	2006 IECC*	2006 NFPA 1* 2008 NFPA 70* 2006 NFPA 101

\* Adopted with amendments

<sup>†</sup> For existing buildings only

<sup>◇</sup> Based on population and previous code adoptions

# MSBC

- Massachusetts State Building Code  
8<sup>th</sup> Edition
  - Based on 2009 IBC (International Building Code)
    - 2009 IEBC (International Existing Building Code)
  - Recently adopted
    - Effective Aug. 6, 2010
  - 6-Month concurrency period
    - Mandatory compliance required Feb. 6, 2011

# MSBC

- Front-end Amendments

**907.2.1.1** Replace as follows:

**907.2.1.1 System Initiation in Group A Occupancies with an Occupant Load of 300 or More.** Activation of the fire alarm in Group A occupancies with an occupant load of 300 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with section 907.5.2.2.

**Exception.** Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.

**907.2.1.2** Add subsection:

**907.2.1.2 A-2 Nightclub Use – Entertainment System Response.** The activation of any *fire protection system* element (signaling system, detection, sprinklering, *etc.*) shall automatically:

1. Cause immediate illumination of all areas and components of the required means of egress, and additionally;
2. Cause immediate full activation of all other house lighting; and
3. Cause immediate stopping of any and all sounds and visual distractions (public address systems, entertainment and dance lighting, music, *etc.*) that conflict/compete with the fire protective signaling system.

**907.2.2** Delete the exception, only



# Chapter 1: Administration

25 7<sup>th</sup> Edition Sections reduced to 16 in 8th:

- 101 General
  - 102 Applicability
  - 103 Dept. of Building Safety (Building Official)
  - 104 Duties of Building Official
  - 105 Permits
  - 106 Construction Documents
  - 107 Submittal Documents
  - 108 Temporary Structures and Uses
  - 109 Fees
  - 110 Inspections
  - 111 Certificate of Occupancy
  - 112 Service Utilities -reserved
  - 113 Board of Appeals
  - 114 Violations
  - 115 Stop work order
  - 116 Unsafe Structures and Equipment
- scope
- administration
- permitting
- construction
- problems

# Chapter 1: Administration

- Key items
  - **Townhouse requirements(101.2) clarified...**
    - 3-stories or less in one and two family code, appendix Z deleted.
  - **Independent Structural Review (105.9) narrowed...**
    - Required on only high rise and complex structures
  - **Construction control(107.6) language tightened...**
    - Alternative means and methods which deviate from prescriptive code requirements must be submitted to the building official for approval, separate from the plans.
  - **IBC inspection language loosened (110.3) ...**
    - Construction inspection intervals may (not shall) include those set forth in sections 110.3.1 through 110.3.10
  - **Periodic Inspection Table 110 (was Table 106) revised:**
    - Annual inspections of group residences removed.
    - Fire escapes included.
  - **Temporary Certificate of Occupancy (111.3) :**
    - IBC language adopted authorizing building official.

# Chapter 3: Use & Occupancy

- Basic Use Groups Remain
- Detailed changes to classifications for:
  - Group Homes – only addressed in Chapter 3, no longer has special section in Chapter 4.
  - Use Group R – incorporates overnight day care and summer camps.
  - Use Group B – new Ambulatory Health Care regulations in Section 422

# Chapter 4: Special Use & Occupancy

Section number changes start with section 19:

7 <sup>th</sup> Edition		8 <sup>th</sup> Edition
19	Mobile Units (Formerly referred to 110 R3, 8 <sup>th</sup> in 110R3)	Live/Work Units R-2, 50% non-residential, ,max 5-employees.
20	Swimming Pools (Formerly in Appendix M, 8 <sup>th</sup> in 3109)	Groups I-1, R-1, R-2, R-3 Fire separation requirements., not special use.
21	Group Residence	Hydrogen Cutoff Rooms Fuel cell related.
22	Day Care Centers	Ambulatory Health Care Facilities Incapable
23	Summer Camps for Children	Storm Shelters Designed to ICC – 500 criteria.
24	Bulk Merchandising	Bulk Merchandising
25	Limited Group Residence	Motion Picture/Television Facilities
26	Detoxification Facilities	Summer Camps for Children
27	Group Dwelling Units	
28	Motion Picture/Television Facilities	

Key: **Red** sections covered elsewhere in the 8<sup>th</sup>  
**Blue** titles new with 8<sup>th</sup> edition.

## Chapter 4: Special Use & Occupancy

- New Technical Provisions for:
  - High Rise Buildings
  - Atriums



# High-Rise Buildings

## Section 403.0

- High-Rise - more than 70 ft above mean grade
  - Same definition as 7<sup>th</sup> edition
- Smoke Removal System (403.4.6)
  - Operable / breakable windows; or
  - Mechanical exhaust at 4 ACH
- Fire Command Center (403.4.5 & 911)
  - Min area is 200 SF (vs 96 SF)
  - Min plan dimension is 10 ft (vs 8 ft)



# High-Rise Buildings

## Section 403.0

- Fire pumps – two separate water supply connections from different streets or provide isolation valve arrangement from one street
- Elevator hoistway pressurization requirements have been increased (708.14.2.1)
  - $dP = 0.10'' \text{ H}_2\text{O}$  min. and  $0.25'' \text{ H}_2\text{O}$  max.
  - 7<sup>th</sup> Edition and 2006 IBC required  $0.04'' \text{ H}_2\text{O}$  min. and  $0.06'' \text{ H}_2\text{O}$  max
- No longer required to have vestibules at smokeproof enclosure stairs that are pressurized (1022.9.2 Exception)

# High Rise Buildings

## Section 403.0

- Fire service elevator – 1-hr lobby w/ standpipes, direct access to a stair, and standby power (403.6.1)



# Luminous Egress Path Markings

Section 1024.0

- High-rise buildings with Use Groups A, B, E, I, M, and R-1
- Markings within exit enclosures
  - Steps
  - Landings
  - Handrails
  - Doors



SOURCE: American PERMALIGHT

# High-Rise Buildings

## Section 403.0

Requirement	> 70 ft	> 120 ft <b>FD Access</b>	> 420 ft
Smoke Removal System	✓	✓	✓
Fire Command Center	✓	✓	✓
Separate Water Supply Connections for Fire Pumps	✓	✓	✓
Hoistway Pressurization Option	✓	✓	✓
Luminous Egress Path Markings	✓	✓	✓
Fire service access elevator (403.6.1) –1 hour lobby w/ standpipe –Direct access to exit stair –Standby power	✓	✓	✓
Additional exit stairway or occupant evacuation elevator with lobby (403.5.2) <sup>1</sup>			✓
No Construction Type Modification (403.2.1)			✓
Impact resistant structural design (403.2.3)			✓
Sprinklers – min. two risers serving alternating floors (403.3.1)			✓

1. Occupant Evacuation Elevator - Reserved by MA.



# Atriums

## Chapter 4

- All two-story floor openings exempt from smoke control, except Use Group H (404.5 ex)
- Smoke control design based on an engineering analysis using NFPA 92B (909.8)

Criteria	6 <sup>th</sup> Edition	7 <sup>th</sup> Edition	8 <sup>th</sup> Edition
Smoke Layer	6 ft	10 ft	6 ft
Fire Size	2,000 Btu/s	5,000 Btu/s*	Subject to designer and engineering analysis
Fire Scenarios	One	Three	Subject to designer and engineering analysis
Time	20 min	20 min	1.5 times egress

\* Alternate Fire Protection design permitted by Chapter 9 can be used to account for sprinklers and geometry

# Example Exhaust Rates

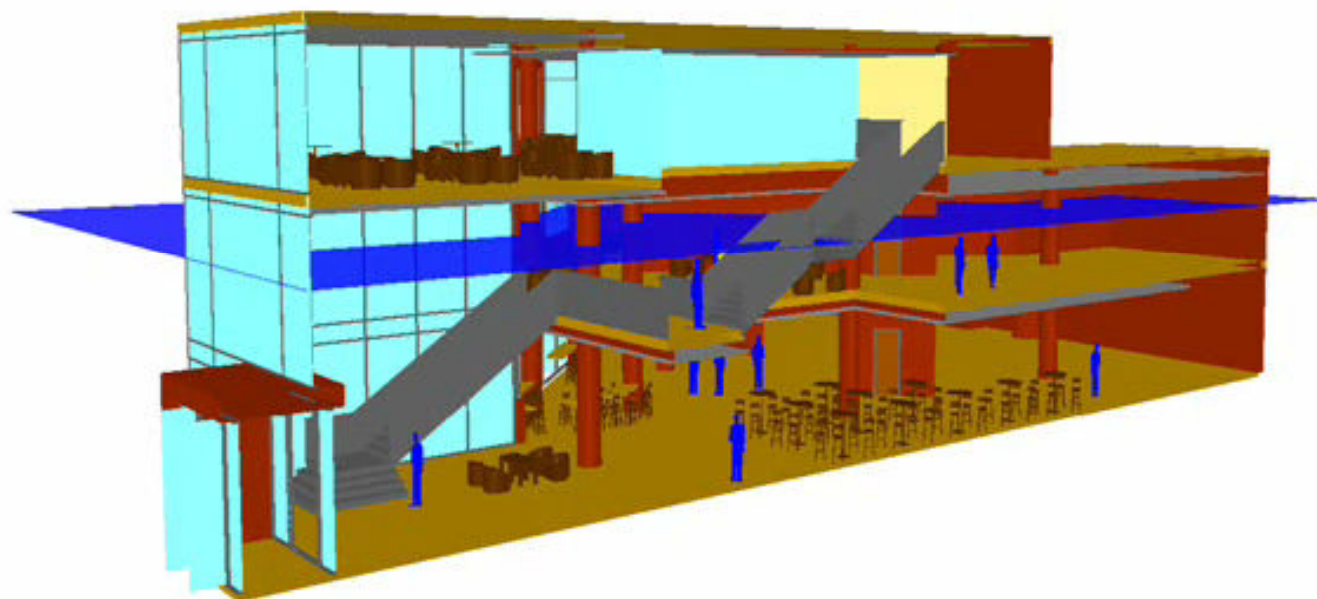
- Example 5-story atrium

<b>Code</b>	<b>Exhaust Requirement (cfm)</b>	<b>Free Area for make-up air @ 200 ft/min (ft<sup>2</sup>)</b>
6 <sup>th</sup> Edition (2,000 Btu/s)	195,930	980
7 <sup>th</sup> Edition (5,000 Btu/s)	664,430	3,320
8 <sup>th</sup> Edition (2,000 Btu/s)	479,655	2,400
8 <sup>th</sup> Edition w/modeling	207,830	600*

\* Fire modeling may show make-up air > 200 ft/min is acceptable

- Fire modeling permitted with a third party review
- Variances for fire modeling are no longer required

Smokeview 5.6 - Oct 29 2010



Frame: 0  
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# HazMat Control Areas

## Chapter 4

- Generally same quantity limits.
- 1-hour floor assemblies now permitted for fully sprinklered buildings of Type IIA, IIIA, and VA construction that are 3 stories above grade or less (414.2.4 exception)
- 7<sup>th</sup> Edition and prior versions of IBC required 2-hour floors regardless of building height

# Special Uses

## Chapter 4

- Live/Work Units (Section 419)
  - Use Group R-2
  - Max of 3,000 sq ft, max of 50% can be nonresidential
  - Non-residential area must be on first or main floor of the unit
- Ambulatory Health Care (Section 422)
  - Use Group B – 1 or more patients incapable of self preservation
  - Smoke compartments (if > 10,000 sq ft)
  - Max distance to smoke barrier door must be < 200 feet
- Motion Picture and Television Production Facilities (Section 425)
  - Standard on Motion Picture and Television Studios (NFPA 140)



# General Building Heights & Areas

## Chapter 5

- The allowable building height in stories has been reduced for Use Groups B, M, S-1, and S-2 of Construction Types IIB and IIIB. See Table 503 for all height and area requirements.

Use Group	7 <sup>th</sup> Edition	8 <sup>th</sup> Edition
Business (B)	4 Stories	3 Stories
Mercantile (M)	4 Stories	2 Stories
Moderate Hazard Storage (S-1)	3 Stories	2 Stories
Low Hazard Storage (S-2)	4 Stories	3 Stories

# Sample Calculation

Construction Type:	8 <sup>th</sup> Edition (IIB)		6 <sup>th</sup> Edition (2C)	
Code Reference	Height (ft)	Area (ft <sup>2</sup> )	Height (ft)	Area (ft <sup>2</sup> )
Table 503	3 Stories (55)	23,000	3 Stories (40)	14,400
Sprinkler Height Increase	+ 1 Story (20)		+ 1 Story (20)	
Street Frontage Area Increase 100 % open		+ 17,250		+ 21,600
Sprinkler Area Increase		+ 46,000		+ 14,400
Multistory Building Area Decrease		N/A		-2,880
<b>Total Allowed</b>	<b>4 Stories (75)</b>	<b>86,250 / Floor 258,750 Aggregate</b>	<b>4 Stories (60)</b>	<b>47,520 / Floor 190,080 Aggregate</b>

- Use Group B Occupancy
- Non-Combustible, Unprotected Construction

# Mixed Use and Occupancy

## Section 508

- Mixed & Accessory Uses moved from Chapter 3 (7<sup>th</sup>) to Chapter 5 (8<sup>th</sup>)
- Buildings containing 2 or more use groups
  - Accessory (height and area only)
  - Incidental Accessory
  - Non-separated Mixed Use
  - Separated Mixed Use
- Incidental storage rooms over 100 ft<sup>2</sup> are no longer required to be separated by 1 hour.

# Use Separations

**TABLE 508.4**  
**REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

OCCUPANCY	A <sup>d</sup> , E		I-1, I-3, I-4		I-2		R		F-2, S-2 <sup>b</sup> , U		B, F-1, M, S-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A <sup>d</sup> , E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3 <sup>a</sup>
I-1, I-3, I-4	—	—	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2	—	—	—	—	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R	—	—	—	—	—	—	N	N	1 <sup>c</sup>	2 <sup>c</sup>	1	2	NP	NP	3	NP	2	NP
F-2, S-2 <sup>b</sup> , U	—	—	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3 <sup>a</sup>
B, F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2 <sup>a</sup>
H-1	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP
H-3, H-4, H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 <sup>e, f</sup>	NP

# Markings and Identification

## Section 703.6

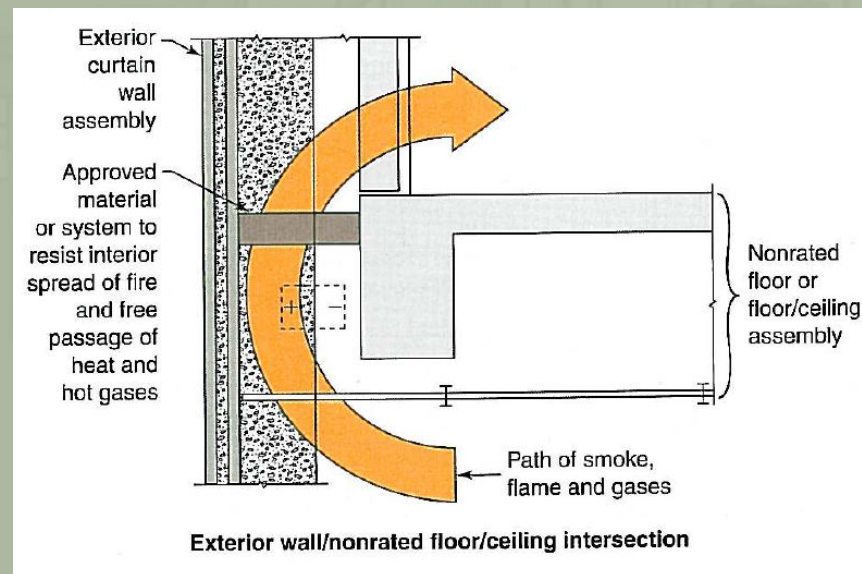
- Fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions, or any other wall required to have protected openings or penetrations must be identified with signs or stenciling
  - Required at 30' intervals horizontally
  - Text must be 1/2"
- “FIRE AND / OR SMOKE BARRIER – PROTECT ALL OPENINGS”



# Exterior Walls

Sections 705.5 & 714.4.1

- Exterior walls are required to be rated for fire exposure from both sides when the fire separation distance is 10' or less (previously 5' or less).
- Clarification: Voids between exterior curtain walls and nonfire-resistance-rated floor or floor/ceiling assemblies must be sealed with approved material to retard the interior spread of fire and hot gasses.



Source: ICC 2009

# Fire Protection Systems

## Chapter 9

### Background:

- BBRS voted to carry forward 7th edition Chapter 9 requirements and not lower level of safety from that required by 7th edition
- IBC has 'enforcement authority' language that needed to be addressed.

# Fire Protection Systems

## Chapter 9

- IBC makes Numerous references to the International Fire Code 2009 (IFC).
  - MA State Fire Code (527 CMR) takes precedence over IFC where 527 CMR specifically addresses the topic.
  - Both 527 CMR & IFC needed to properly review/enforce (901.1 Note 2)

# Fire Protection Systems

## Chapter 9

- Authority language streamlined: In most cases approval authority lies with either the building official or fire official.
- Emergency responder radio coverage required for all new buildings
- Required smoke alarms still photoelectric only.
- Portable Fire Extinguisher section expanded.
- Carbon Monoxide protection clarified...is required for all places with sleeping arrangements, not just where there is parking or fossil fuel burning equipment.
- Smoke Proof Enclosures: Unique MA requirement not carried to the 8<sup>th</sup> edition.

# Fire Protection Systems

## Chapter 9

**Submittals (107.1.2):** Local Fire Department must review/approve fire protection submittals for building permit.

**Acceptance Tests (901.5).** Building official and/or fire official (or third party) must witness acceptance tests

**Sprinkler requirements (Table 903.2)**

- Most sprinkler thresholds in Tabular form. Note: fire area concept from IBC of where sprinklers are required is not valid. Sprinklers generally required throughout building when required.

**Sprinkler Standards**

- Clarified NFPA 13R use – cannot be used in a Mixed Use building
- Clarified that townhouses require fire sprinkler protection
- 13R not allowed in R-Use when area greater than 12,000 ft.
- Balconies of Type V construction need sprinkler protection when using a 13R system (903.3.1.2.1)

**A-2 Nightclub fire alarm activation(907.2.1.2) :** illuminate egress; bring house lights to full; stop audible/visible distractions

**Use Group E fire alarm system(907.2.3):** requires voice capabilities

# Automatic Sprinkler System

Section 903.2.01

- Required in all new buildings over 7,500 sf with sufficient water and water pressure (MGL Ch. 148 Sec. 26G)
  - Building size determined irrespective of the existence of interior “fire resistive walls”
  - Exceptions: open parking structures, residential buildings, & state owned facilities
- Enforced by fire official independent of building code



# MGL Ch. 148 Sec. 26G

- Construction of addition can require sprinkler protection throughout existing building
- Automatic Sprinkler Appeals Board Advisory Memo (guideline only)
  - Existing Buildings - Work over a 5 year period may be considered “major” alteration if:
    - Work area exceeds 33% of GSF; OR
    - Cost of work exceeds 33% of assessed value

# Means of Egress

## Chapter 10

### MA-unique requirements of 7<sup>th</sup> & 8<sup>th</sup> Edition:

- **Fire escapes:** Maintenance and certification, etc.
- **MA-Specialized Codes:** Express recognition of.
- **B-use locking arrangements:** Special MA-allowed locking arrangements for B-USE buildings where 1 tenant occupies an entire floor.
- **Electromagnetic striker lock:** Recognition of MGL c.143 § 3R.
- **Nightclub egress:** Special egress requirements for new construction nightclubs.

# Means of Egress

## Chapter 10

### Differences between the 7<sup>th</sup> and 8<sup>th</sup>:

- **Minimum egress dimensions (1005.1):** 7<sup>th</sup> Edition egress factors of 0.15 / 0.2 allowed (except in H & I-2 occupancies) only when equipped w/fire sprinklers **AND** voice evacuation. Otherwise must use 0.2 / 0.3 egress factors.
- **Electrical rooms (1011.1.1) :** Now required to have additional exit signage no more than 18 inches off of the floor.
- **Exit travel distance increase for F-1 or S-1 Uses (1016.1) :** Allowed exit travel distance increased to 400' for one story F-1 and S-1 Uses when such buildings equipped throughout w/fire sprinklers and buildings have automatic heat and smoke roof vents.
- **Assembly main exit, (1028.2 EXCEPTION):** For nightclubs w/50 or more occupants, this Exception allowing distributed exits is overridden by the primary main exit requirements for nightclubs .

# Chapter 10

Table 1004.1.1

- Occupant Load Table has additional uses and some factors have changed

Occupancy	6 <sup>th</sup> Edition	7 <sup>th</sup> /8 <sup>th</sup> Edition
Dormitory	200 gross	50 gross
Assembly Standing	3 net	5 net
Assembly Gaming	?	11 gross
Day Care	?	35 net
Exercise Rooms	?	50 gross
Kitchens	?	200 gross
Stages & Platforms	?	15 net

- Actual occupant load may be used if approved by the building official

# Egress Capacity

## Section 1005.1

- Egress capacity factors are as follows (other than H and I-2):

Building	Component	6 <sup>th</sup> and 7 <sup>th</sup> Editions (Inches / occupant)	8 <sup>th</sup> Edition (Inches / occupant)
Not Sprinklered	Stairways	0.3	0.3
	Other Components	0.2	0.2
Sprinklered	Stairways	0.2	0.3
	Other Components	0.15	0.2
Sprinklered and Voice Alarm Communication System - Except H & I-2 (MA Amend.)	Stairways	0.2	0.2
	Other Components	0.15	0.15

- Amendment for fully sprinklered existing buildings.

# Chapter 10

Table 1004.1.1



- Occupancy is different than occupant loads

Occupant Load Densities (780 CMR TABLE 1004.1.1)	
Fixed Seating	Assembly with Fixed Seats - 18" per Occupant
7 Net S.F. / Occ.	Assembly without Fixed Seats - Concentrated (Chairs)
15 Net S.F. / Occ.	Assembly without Fixed Seats - Unconcentrated (Tables and Chairs)
20 Net S.F. / Occ.	Classrooms
100 Gross S.F. / Occ.	Office Areas
300 Gross S.F. / Occ.	Storage / Mechanical

# Panic Hardware

## Section 1008.1.10

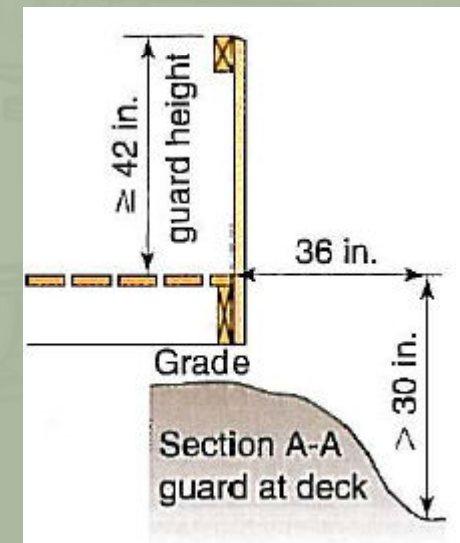
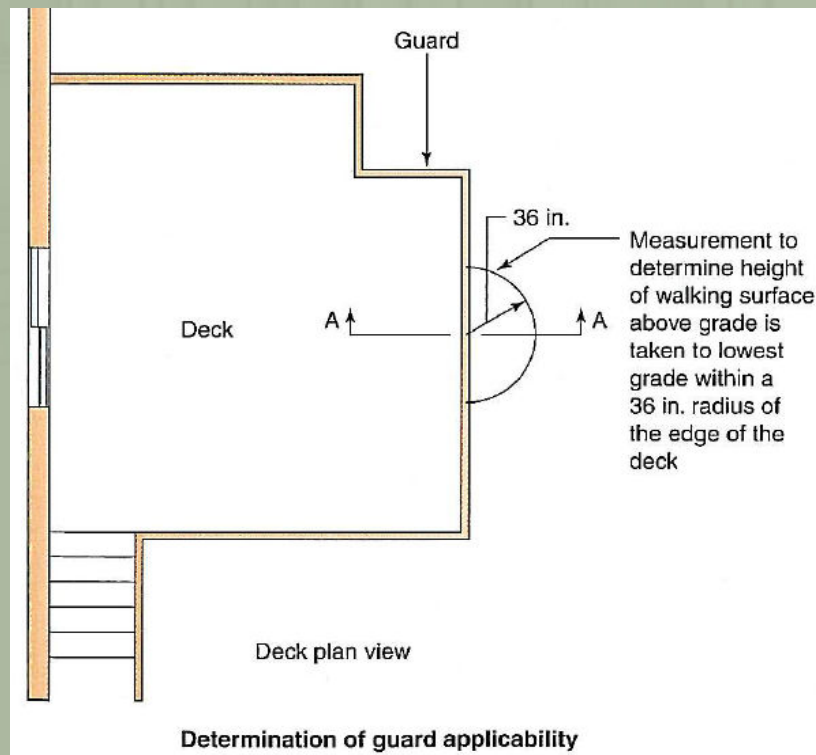
- Doors serving Group H or rooms and spaces with an occupant load of 50 in Groups A or E must not be provided with a latch or lock unless it is panic hardware or fire exit hardware
  - Required in 7<sup>th</sup> edition for Group H or 100 occupants in Groups A or E



# Required Locations for Guards

## Section 1013.1

- Requirements for guards are now determined based on the lowest grade point measured vertically from within a horizontal 36-inch radius from the walking surface

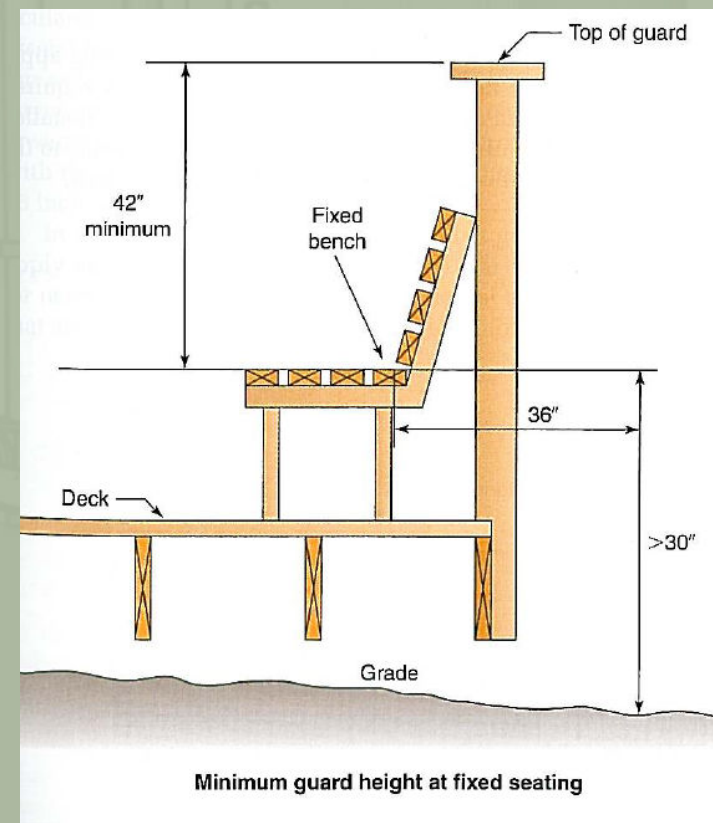


Source: ICC 2009

# Minimum Guard Height at Fixed Seating

Section 1013.2

- Fixed seating next to a guard is now considered a walking surface, the minimum height of the guard is now measured from that surface.



Source: ICC 2009

# Single Means of Egress

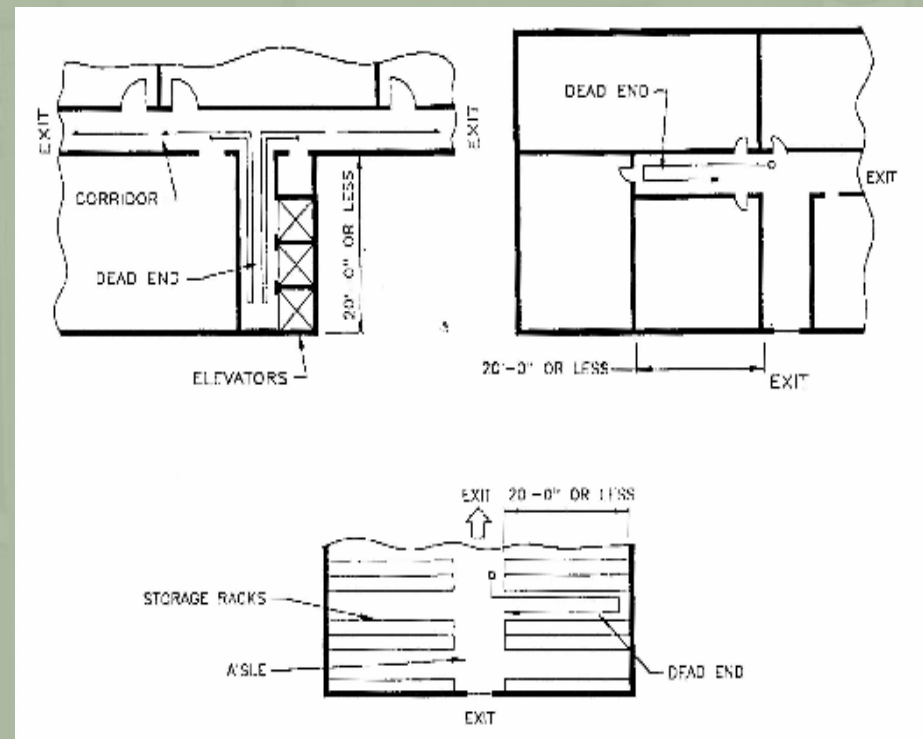
Section 1014.3 & 1015.1

- Use Group R-2
  - Occupant load increased from 10 to 20 people in buildings equipped with an automatic sprinkler system.
  - Common path of travel increased from 75' to 125' in buildings equipped with an automatic sprinkler system.
- Day Care (E or I-4)
  - Max. occupant load of 10 for single-exit classrooms (350 sqft. @ 35 sqft. per occupant)
  - 7<sup>th</sup> Edition limit was 50 people (1,000 sqft.)

# Dead Ends

## Section 1018.4

- 50 ft dead end allowance expanded to include fully sprinklered Use Groups E, I-1, M, R-1, R-2, R-4, S and U in addition to Use Groups B and F



# Open Egress Stairs

IBC Section 1022.1 & 1016.1

- 1016.1 Exceptions 3 & 4 allow 2 story open stairs to serve as required means of egress.
- Exceptions moved to exit access section (no exception in stair enclosure section)
- Travel distance measured along open stair to exterior door or rated exit enclosure.



# Energy Efficiency

## Chapter 13

### Overview

- What is the Same?
  - Technical and administrative MA Amendments.
  - ASHRAE 90.1-2007 remains the default design option.
- What is different?
  - Format and Section numbering
  - No new major requirements; The devil is in the details...

# Energy Efficiency

## Chapter 13

### Changes and noted issues:

- **MA Amendments;** No technical/administrative differences between 7<sup>th</sup> & 8<sup>th</sup> Edition.
- **Technical differences ;** are between IECC-2006 w/2007 Supplement and IECC-2009.
- **Format/Section numbering changes;** exist between IECC-2009 and earlier variant.
- **ASHRAE 90.1-2007(C1);** remains the default design option.
- **Administrative criteria (C1);** C1 of the 8<sup>th</sup> overrides the admin. criteria of C1 of IECC-2009.
- **Vapor retarder (C4);** requirements of IECC-2007 moved to IRC-2009, C6 & C11.
- **Prescriptive changes (T402.1.1 and T402.1.3);** several numerical changes to R or U Factors.
- **Optional air leak testing (402.4.1);** allows, as an option, physical air leakage testing (testing is not mandatory as visual inspections allowed).
- **Computer modeling (405);** : “SIMULATED PERFORMANCE ALTERNATIVES” has an expanded set of guidance/requirements on how to do such computer modeling.
- **Prescriptive changes (T502.1.2 & T502.2(1));** reflect more stringent R and U values and generally require different R and U values for “Commercial” buildings v. “Residential” buildings.
- **Vapor retarder(C5);** requirements of IECC-2006/2007 moved to C14 of the IBC-2009.



# Energy Efficiency

## Chapter 13

- **HVAC equipment performance requirements** ( 503.2.3); the EXCEPTION, now in more detail, addresses water-cooled centrifugal water chilling packages not designed for operation at ARHI Standard conditions.
- **Chiller efficiency** (T503.2.3(7)); updated efficiency requirements.
- **Snow melt systems** (503.2.4.5); requires auto shutoff controls for heated pavements.
- **Pipe insulation** (T503.2.8); has slightly more conservative pipe insulation thicknesses than earlier table versions.
- **Air systems** (503.2.10): inclusive, addresses air system design and control.
- **Hydronic pump system** (503.4.3.3); “Hydronic (water loop) heat pump systems”, inclusive, updated.
- **Lighting in dwelling units** (505.1) ; EXCEPTION, exempts lighting w/in dwelling units where 50% or more of permanently installed interior light fixtures use high-efficacy lamps.
- **Total connected interior lighting power** (505.5.1); EXCEPTIONS have been expanded.
- **Exterior light zones** (T505.6.2(1)); Table has been added.
- **Total building performance** (506 inclusive); has an expanded set of guidance/requirements on how to do such computer modeling.

# Energy Code

- Additions, renovations, and repairs to an existing building must conform to the code for new construction, without requiring the unaltered portion of the building to comply
- If the energy use of the building is not increased the following need not comply:
  - Storm windows
  - Glass only replacements in existing sash and frame (unless required elsewhere in IEBC)
  - Existing ceiling, wall, and floor cavities exposed during construction – if filled with insulation
  - Construction where existing roof, wall or floor cavity is not exposed

# CHAPTER 115 AA Stretch Energy Code

## Overview

- The STRETCH ENERGY CODE is the first locally adoptable set of 780 CMR regulations that the BBRS has ever promulgated.
- This Energy Code affects low rise residential buildings (both new construction and existing buildings when undergoing renovation), as well as new construction “commercial” buildings of certain sizes (but does not impact existing “commercial” buildings undergoing renovation (baseline energy code requirements do impact existing “commercial” buildings undergoing renovation).

# Existing Buildings

- Introduction to IEBC
- Compliance Options
  - Prescriptive
  - Work Area
  - Performance
- Energy Code
- Accessibility Codes:
  - Massachusetts Architectural Access Board Regulations
  - American's with Disabilities Act



# MA Building Code



- Chapter 1: Applicability to existing buildings (780 CMR 102.6)
  - 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 occupants and the public.

# Existing Building

## Definition of an 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. (IEBC 202)

No 5 year rule.

# International Existing Building Code

(2009 IEBC)

- To be adopted with the 8<sup>th</sup> Edition of 780 CMR as Chapter 34.
- IBC Chapter 34 to be deleted (it all is repeated in IEBC).
- All IEBC provisions for electrical, plumbing, and accessibility to be deleted.



# Three Compliance Methods

Chapters	Subjects
1-2	Administrative Requirement and Definitions
3	Prescriptive Compliance Method
4-12	Work Area Compliance Method
4	Classification of Work
5	Repairs
6	Alterations: Level 1
	Alterations: Level 2
	Alterations: Level 3
	Change of Occupancy
10	Additions
11	Historic Buildings
12	Moved or Relocated Buildings
13	Performance Compliance Method

The method is the choice of the owner. The three methods are independent.

Work Area Method may have some dependency between chapters.

# 3 Compliance Methods

- Three ways to comply with the code:
  - Prescriptive Compliance Method:
    - Additions, alterations or repairs, unless otherwise noted, follow that of new construction.
  - Work Area Compliance Method:
    - Requirements are based on level of work and generally applies to work area only.
  - Performance Compliance Method:
    - Utilizes a point system to ensure the level of public safety, health & welfare is maintained or exceeded after a renovation.
- Regardless of which option is chosen, IEBC Chapter 1 always applies and contains many unique MA amendments (i.e. structural systems, egress, fire protection, etc).

# Existing Building Reports

## IEBC MA Amendment Section 101.5.4.0

- For any proposed work regulated by this code, the existing building shall be evaluated in accordance with the provisions of this code, including:
  - Design gravity loads
  - Lateral load capacity
  - Egress Capacity
  - Fire protection systems
  - Fire resistive construction
  - Interior environment
  - Hazardous materials
  - Energy conservation

A written report must be submitted to the building official as a condition of the issuance of a building permit.

# MA Egress Amendment

IEBC MA Amendment Section 102.2.2

- Means of egress in existing buildings, whether or not undergoing repairs, alterations, or changes of occupancy must comply with the code provisions for new construction in regards to:
  - 1) The minimum number of exits
  - 2) Required egress capacity

# Sprinklers in Existing Buildings

IEBC MA Amendment Section 102.2.1.2

- Reference to the amended MGL148 Section 26G
  - All buildings over 7,500 gsf undergoing addition or major renovation
    - Renovations totaling 33% or more of the total gross square footage
    - Renovation costs equal to or greater than 33% of the assessed building value
  - Applies throughout the state

The background of the slide is a faded, green-tinted image of an industrial facility with numerous pipes, valves, and structural beams.

# Prescriptive Compliance Method

Chapter 3

# Prescriptive Compliance Method

## Chapter 3

- Building Materials (IEBC 301.2)
  - Existing materials may remain only if they are safe.
  - New and replacement materials must be that of new construction. Like materials are only permitted if they are safe.





# Prescriptive Compliance Method

## Chapter 3

- Repairs (304):
  - Routine maintenance and ordinary repairs, exempt from permit, are not required to comply with the provisions of this section (304.1).
  - Nonstructural repair work other than routine maintenance / ordinary repairs requires a permit and can be made with same or like materials (304.1 and 301.2).
  - Structural damage that is not substantial can be repaired to restore the building to its original condition (304.4).
  - Substantial structural damage must be repaired to meet minimum loads described in 304.2 (lateral loads) & 304.3 (gravity loads).

# Prescriptive Compliance Method

## Chapter 3

- Additions (302):
  - Additions to the building or structure must comply with 780 CMR (2009 IBC) for new construction.

# Prescriptive Compliance Method

## Chapter 3

- Alterations (303):
  - BBRS FAQ

IEBC Section 303.1 states that “...alterations to any building or structure shall comply with the requirements of the code for new construction.” Under 780 CMR this provision **is intended to require that the entire “work area” (as defined by the IEBC) be brought into full compliance with the provisions of 780 CMR for new construction,** unless otherwise specifically exempted by IEBC Chapter 3 (i.e. existing materials (IEBC Section 301.2), IEBC Chapter 3 structural provisions, etc.).

# Prescriptive Compliance Method

Section 303.3 – 303.4

- Alterations:
  - Existing structures carrying gravity loads must meet the code for new construction under any of the following circumstances:
    - The design gravity load is increased by 5%.
    - The capacity of the structural member is reduced.
  - Existing structures carrying lateral loads must meet the code for new construction under any of the following circumstances:
    - The design lateral load is increased.
    - The alteration results in a structural irregularity as defined in ASCE 7.
    - The capacity of the structural member is reduced.
    - Exception: Lateral load-carrying members where the demand-capacity ratio with the alteration is increased by less than 10% of the ratio when ignoring the alteration.

# Prescriptive Compliance Method

## Chapter 3

- Fire Escapes (305)
  - Existing fire escapes are only allowed to be counted as means of egress on existing buildings if tested and certified.
  - New fire escapes on existing buildings are only permitted if exterior stairs are infeasible.
    - Restrictions on location
    - Cannot access through a window or use ladders.



# Prescriptive Compliance Method

## Chapter 3

- Change of Occupancy (307)
  - Cannot change use/occupancy unless the building meets the requirements of IEBC for the proposed occupancy.
    - Variances allowed if the new use is less hazardous than the existing use based on life and fire risk (subject to approval)

# Work Area Method

Chapters 4 – 12

# Work Area Compliance

Chapters 4 - 12

- Provisions are based on the type of work as defined in Chapter 4
  - Repairs (402):
    - Patching, restoration, or replacement of damaged elements to good or sound condition for maintenance purposes.
  - Level 1 Alteration (403):
    - Alterations to elements to serve the same purpose. No reconfiguration of spaces.
  - Level 2 Alteration (404):
    - Reconfiguration of spaces
    - Addition or elimination of windows or doors
    - Installation of any additional equipment
    - Renovation area  $\leq 50\%$  of the aggregate building area.
  - Level 3 Alteration (405):
    - Renovation area  $> 50\%$  of the aggregate building area.
  - Change of Occupancy (406)
  - Additions (407)
  - Historic Buildings (408)
  - Relocated Structures (409)



# Repairs

## Chapter 5

- Nonstructural repair work other than routine maintenance / ordinary repairs requires a permit and can be made with same or like materials.
- Structural damage that is not substantial can be repaired to restore the building to its original condition (506.2.1).
- Substantial structural damage must be repaired to meet minimum loads described in 506.2.2 (lateral loads) & 506.2.3 (gravity loads).

# Level 1 Alteration

## Chapter 6

- New finishes must comply with the IBC for new construction (602.1 – 602.3).
- New work must comply with the materials and methods of the applicable code (602.4).
- Structural upgrades could include:
  - Gravity members if dead load increased by  $> 5\%$
  - Anchoring / bracing of masonry / concrete walls
  - Roof diaphragms and connections to resist wind loads

# Level 2 Alteration

## Chapter 7

- Compliance with Level 1 work required (701.2).
- All new construction and elements must comply with the code for new construction except as noted in Chapter 7 (701.3).
  - For example dead end corridors and ceiling heights have slightly less stringent requirements.

# Level 2 Alteration

## Floor Openings (703.2)

- All floor openings must be enclosed with 1-hour fire resistance rated construction except:
  - Where permitted by the code for new construction
  - “Mini-Atrium” – 3 story atrium at grade
  - Use Group specific allowances for rating reductions or allowed floor openings
    - Existing open stairs up to 3 stories are permitted in fully sprinklered buildings of Use Group B, E, F, M, R-1, R-2, S

# Level 2 Alteration

## Floor Openings (703.2)

- Additional Requirements (703.2.2):
  - If work area exceeds 50% of the floor area, then all vertical openings other than stairways must be enclosed (applies outside work area)
    - Does not include vertical openings in tenant spaces completely outside the scope of work.
- Stairway Enclosure Requirements (703.2.3):
  - If work area exceeds 50% of the floor area, then all egress stairways must be enclosed with smoke-tight construction (at a minimum) from the highest work area floor and all floors below.
    - Unless enclosure is not required by the IBC

# Level 2 Alteration

## Chapter 7

- Existing interior finishes in exits and corridors within work area must comply with IBC requirements (703.4)
  - If the work area is > 50% of the floor area, entire floor must use IBC approved finishes
- Automatic sprinkler systems must be installed in the work area if: (704.2)
  - The work area has exits or corridors shared by more than one tenant or they serve more than 30 occupants
  - The work area exceeds 50% of the floor area
  - The water supply is sufficient
  - The IBC requires it
- Fire alarm systems are required in the work area for Use Group E, I, and R occupancies (704.4)
  - Required throughout the floor if the work area exceeds 50% of that floor

# Level 2 Alteration

## Chapter 7

- Fire escapes are permitted to be used as a means of egress as long as they meet the requirements of 705.3.1.2.
- In general, egress requirements for doorways or corridors in work areas follow that of new construction (705.4-6)
  - Existing dead end corridors up to 35 ft are allowed (705.6)
  - In other than A and H occupancies, dead end corridors up to 70 ft are allowed if fully sprinklered

# Level 3 Alteration

## Chapter 8

- Compliance with Level 1 and 2 work required (801.2)
- Existing shafts and vertical openings must be protected by a 1 hour wall from the floor of the work area to the level of exit discharge (803.1)
- Fire alarm and detection systems must be provided throughout the building where required by Section 704.4 (Level 2).
- Means of egress lighting must be provided from the highest work area floor to the floor of exit discharge (805.2).
- Exit signs must be provided from the highest work area floor to the floor of exit discharge (805.3).



# Level 3 Alteration

## Chapter 8

- Structural analysis required
  - More than 30% of total floor and roof areas are structurally altered within a 12-month period
    - Subject to IBC wind loading and reduced seismic forces
  - Less than 30% of total floor and roof areas are structurally altered within a 12-month period
    - Must demonstrate that the altered building complies with the loads applicable at the time of original construction or most recent substantial renovation

The background of the slide is a faded, light green image of an industrial facility, showing a complex network of pipes, valves, and structural beams, typical of a chemical or petrochemical plant.

# Change of Occupancy

## Chapter 9

# Change of Occupancy

## Chapter 9

- Definition - A change in the purpose or level of activity within a building that involves a change in application of the requirements of this code
- Applies
  - When the occupancy classification is not changed
  - Where there is a change in the occupancy classification or the occupancy group designation changes

# Change of Occupancy

## Chapter 9

- Where the change in use is to a special use category, the building must comply with the code for new construction (902.1)
  - Covered mall buildings
  - Atriums
  - Motor vehicle-related occupancies
  - Aircraft-related occupancies
  - Motion picture-projection rooms
  - Stages and platforms
  - Special amusement buildings
  - Incidental use areas
  - Hazardous materials

# Change of Occupancy

## Chapter 9

- Change of Occupancy Classification
  - Within a group
  - From one group to another
- Partial Change in Use
  - Where not separated from the remainder of the building, the entire building must comply with Level 3 requirements
- Fire sprinkler, alarm & detection systems are required based on the new occupancy
- Interior finishes of areas that changed occupancies must meet the requirements of new construction (912.3)

# Change of Occupancy

## Chapter 9

- Hazard Categories determine what needs to be updated to new construction standards when changing occupancies.



# Hazard Categories

## Chapter 9

- Means of Egress (912.4)
- Height and Area (912.5)
- Exterior Wall Fire-Resistance (912.6)
- Enclosure of Vertical Shafts (912.7)

# Hazard Categories

## Means of Egress (912.4)

**TABLE 912.4**  
**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

**TABLE 912.5**  
**HEIGHTS AND AREAS HAZARD CATEGORIES**

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



# Hazard Categories

## Chapter 9

- In general, when changing to a higher hazard category occupancy, must comply with new construction.
- When changing to equal or lesser occupancy hazard category:
  - Egress:
    - Existing egress elements must comply with Level 3 Alteration criteria
    - New egress elements must meet criteria of new construction.
    - Egress capacity must always meet or exceed the requirements for new construction for the occupancy.
  - Height and Area:
    - The existing height and area is acceptable.
  - Exterior Walls:
    - The existing exterior walls and openings of the building are acceptable.

# Additions

## Chapter 10

# Additions

## Chapter 10

- All additions to existing structures, including areas impacted by an addition, must meet the new construction requirements unless otherwise noted (1001.1)
- Additions must meet height and area limitations of the code for new construction (1002.1)
- Existing fire areas increased by the addition must be provided with fire protection systems per the code for new construction (1002.3)

# Additions

## Chapter 10

- Existing structure carrying gravity loads must meet the code for new construction under any of the following circumstances:
  - The design gravity load is increased by 5%.
  - The capacity of the structural member is reduced.
- The addition and existing building acting as a single structure must meet the code for new construction for lateral loads where the addition is not structurally independent.
  - Exceptions: Existing lateral load-carrying members where the demand-capacity ratio with the addition is increased by less than 10% of the ratio when ignoring the addition.

The background of the slide is a faded, light green image of an industrial interior. It shows a complex network of pipes, valves, and large cylindrical tanks, typical of a factory or refinery setting. The perspective is from within the space, looking down a corridor or towards a large piece of equipment.

# Historic Buildings

## Chapter 11

# Historic Buildings

## Chapter 11

- 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
- There is no obligation for owners of historic buildings to use the provisions of this chapter (1101.1).
  - Can apply base IEBC as if non-historic; or
  - Section 308 which does not require compliance with the provisions relating to construction, repair, alteration, addition, restoration and moved structures, and change in occupancy where the building official deems the building to not constitute a distinct life safety hazard



# Historic Buildings

## Chapter 11

- Repairs to any portion of the historic building or structure are permitted to be with original or like materials and original methods of construction (1102.1).
- 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 (1102.5).
- If a historic building cannot meet IEBC and poses a distinct fire hazard the code official may require the installation of an automatic fire-extinguishing system as an effective substitute for some requirements, however, sprinklers cannot be installed in lieu of providing the required number of exits (1103.2).
- Existing egress components are permitted as long as the code official deems they are safe of egress (1103.3).



# Historic Buildings

## Chapter 11

- In buildings 3 stories or less, exit stairways must be enclosed to limit the spread of smoke; however, they are not required to have a fire-resistance rating (1103.6).
- Grand stairways need not comply with the handrail and guard requirements as long as they are not structurally dangerous (1103.9).





# Historic Buildings

## Chapter 11

- Manual fire extinguishing equipment and manual pull stations are required for house museums in all use groups other than R-3 and R-4 (1103.12).
  - Fire extinguishers aren't required if the building is equipped with a sprinkler system.
- Fire alarm systems are required in all house museums as specified in Section 1103.12(2)
- Smoke detection equipment is only required in R-1,-2,-3 when equipped with a sprinkler system.

# Historic Buildings

## Chapter 11

- Change of occupancy in an historic building shall apply with the appropriate provisions of Chapter 9 unless otherwise noted. (1105.1)
  - Some Notable exceptions:
    - Building area limits are allowed to be exceeded by 20% for change of occupancy (1105.2)
    - Occupancy separation of 1 hour can be omitted if equipped with an approved automatic sprinkler system (1105.4)
    - For buildings less than 3,000 sq ft existing conditions are permitted to remain at all stairs and rails (1105.11)

# Relocated or Moved Buildings

## Chapter 12

# Relocated or Moved Buildings

## Chapter 12

- The building must be located on the lot in accordance with the IBC or IRC as applicable
- The foundation and the connection to the foundation must be in accordance with the IBC or IRC as applicable.



The background of the slide is a faded, light green image of an industrial facility, showing various pipes, valves, and structural elements, possibly a water treatment plant or refinery.

# Performance Compliance Methods

Chapter 13

# Performance Compliance Methods

## Chapter 13

- Applies to alterations, repairs, additions and change of occupancies in existing buildings including historic and moved.

# Performance Compliance Methods

## Chapter 13

- Change in Occupancy
  - Provisions of this chapter must be that of the new occupancy
- Partial Change in Occupancy
  - If separated by a fire barrier then only the section changed needs to comply
  - If not, then the more stringent of the provisions between the two occupancies shall apply to the entire building
- Additions
  - Must meet IBC requirements for new construction.
  - Height and area limitations of IBC can not be exceeded
  - If a fire wall is provided between existing building and addition, then the addition can be considered a separate building.
- Alterations and Repairs
  - If the existing building does not comply with the code for new construction, any alterations or repairs cannot result in the buildings being less safe.



# Performance Compliance Methods

## Chapter 13

- 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





# Evaluation – Building Score

## Section 1301.7

TABLE 1301.7  
SUMMARY SHEET—BUILDING CODE

Existing occupancy _____	Proposed occupancy _____
Year building was constructed _____	Number of stories _____ Height in feet _____
Type of construction _____	Area per floor _____
Percentage of open perimeter increase _____ %	Corridor wall rating _____
Completely suppressed: Yes _____ No _____	Required door closers: 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 _____	Type and location _____
Fire alarm system: Yes _____ No _____	Type _____
Smoke control: Yes _____ No _____	Type _____
Adequate exit routes: Yes _____ No _____	Dead ends: _____ Yes _____ No _____
Maximum exit access travel distance _____	Elevator controls: Yes _____ No _____
Means of egress emergency lighting: Yes _____ No _____	Mixed occupancies: Yes _____ No _____

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
1301.6.1 Building Height			
1301.6.2 Building Area			
1301.6.3 Compartmentation			
1301.6.4 Tenant and Dwelling Unit Separations			
1301.6.5 Corridor Walls			
1301.6.6 Vertical Openings			
1301.6.7 HVAC Systems			
1301.6.8 Automatic Fire Detection			
1301.6.9 Fire Alarm System			
1301.6.10 Smoke control	***		
1301.6.11 Means of Egress	***		
1301.6.12 Dead ends	***		
1301.6.13 Maximum Exit Access Travel Distance	***		
1301.6.14 Elevator Control	***		
1301.6.15 Means of Egress Emergency Lighting			
3412.6.16 Mixed Occupancies			
3412.6.17 Automatic Sprinklers		****	
3412.6.18 Standpipes		÷ 2 =	
3412.6.19 Incidental Accessory Occupancy			
<b>Building score — total value</b>			

\*\*\*No applicable value to be inserted.

Insert points  
from  
evaluation of  
building  
elements

# Evaluation – Compartmentation

## Section 1301.6.3

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

**TABLE 1301.6.3**  
**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-1	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<sup>2</sup>.

# Evaluation – Vertical Openings

## Section 1301.6.6

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

**TABLE 1301.6.6(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 1301.6.6(2)**  
**CONSTRUCTION-TYPE FACTOR**

F A C T O R	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

# Evaluation – Fire Alarm Systems

## Section 1301.6.9

- 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 1301.6.9  
FIRE ALARM SYSTEM VALUES**

OCCUPANCY	CATEGORIES			
	a	b <sup>a</sup>	c	d
A-1, A-2, A-3, A-4, B, E, R	-10	-5	0	5
F, M, S	0	5	10	15

# Evaluation – Means of Egress

## Section 1301.6.11

- 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

**TABLE 1301.6.11(2)  
MEANS OF EGRESS VALUES**

OCCUPANCY	CATEGORIES				
	a <sup>a</sup>	b	c	d	e
A-1, A-2, A-3, A-4, E	-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



# Evaluation – Automatic Sprinklers

## Section 1301.6.17

- 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

**TABLE 1301.6.17  
SPRINKLER SYSTEM VALUES**

OCCUPANCY	CATEGORIES					
	a <sup>a</sup>	b <sup>a</sup>	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

a. These options cannot be taken if Category a in Section 1301.6.18 is used.

# Evaluation – Safety Scores

## Section 1301.8

**TABLE 1301.8  
MANDATORY SAFETY SCORES<sup>a</sup>**

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
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

# Construction Safeguards

## Chapter 14



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- Construction sites must be kept safe for workers and pedestrians:
  - Fire protection systems
    - Fire extinguishers (1404)
    - Standpipes (1406)
    - Sprinkler systems (1407)
  - Means of egress
  - Protected walkways
  - Barricades/Barriers
  - Covered walkways (when required)
  - Adequate lighting
  - Accessibility requirements

# Energy Code

- Additions, renovations, and repairs to an existing building must conform to the code for new construction, without requiring the unaltered portion of the building to comply
- If the energy use of the building is not increased the following need not comply:
  - Storm windows
  - Glass only replacements in existing sash and frame (unless required elsewhere in IEBC)
  - Existing ceiling, wall, and floor cavities exposed during construction – if filled with insulation
  - Construction where existing roof, wall or floor cavity is not exposed

The background of the slide is a faded, light green image of an industrial facility, likely a water treatment plant, showing various pipes, valves, and large cylindrical tanks.

# Accessibility

521 CMR

# 521 CMR: Massachusetts Architectural Access Board

- Existing Buildings: Renovations (3.3)
  - The level of compliance for existing buildings is based on the following thresholds:
    - Work costs less than \$100,000: only the work being performed is required to comply.
    - Work costs \$100,000 or more but less than 30% of assessed value of existing building: in addition to work being performed, an accessible public entrance and an accessible toilet room, telephone and drinking fountain must comply with 521 CMR (if public toilets, telephones and drinking fountains are provided).
      - Exempt Work: Curb cuts, MEP without architectural alterations, roof repair or replacement, window repair or replacement, repointing and masonry repair, septic systems, site utilities, and landscaping.

# 521 CMR: Massachusetts Architectural Access Board

- Existing Buildings: Renovations (3.3), con't
  - Cost of work is equal to 30% or more of the assessed value of the existing building: entire building is required to comply with 521 CMR.
    - Exempt Work: None
- In determining applicability of 521 CMR, the cost of all work performed within a 3 year period must be added together.

# ADA: 28 CFR Part 36

- Existing Buildings: Alterations (36.402, 36.403)
  - Altered portions of a facility are required to comply with the accessibility regulations to the maximum extent feasible.
  - The accessibility of the path of travel and facilities (toilet rooms, drinking fountains, etc.) serving an altered area must also be improved, unless the cost and scope of the overall alteration is disproportionate to the cost of the overall alteration.
    - Disproportionate = cost exceeds 20% of the cost of primary alteration
    - If the cost of alterations to the path of travel or facilities is disproportionate, these areas must still be improved up to 20% of the cost of the primary alteration.
  - Alterations by a tenant in areas that only the tenant occupies do not trigger an obligation for the landlord to improve the accessibility of the path of travel or facilities used by tenant, if those areas are not otherwise being altered.

# ADA: 28 CFR Part 36

- Existing Buildings: Removal of Barriers (36.304)
  - Existing Public Accommodation: architectural barriers must be removed where such removal is able to be carried out without much difficulty or expense.
  - Priorities:
    - Accessible route and entrance to facility.
    - Access to areas within the facility where goods and services are made available to the public.
    - Accessible restroom facilities.
    - Take any other measures necessary to provide access to accommodations, privileges, advantages, goods, or services of a place of public accommodation

# Thank You

- Questions/Comments?
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