




Significant Code Changes Massachusetts State Building Code – 9th Edition (2015 International Code)


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Company Overview


- R.W. Sullivan Engineering (RWS) was established in 1945 and currently has 95 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

Agenda

- Adoption Schedule
- Major Changes
 - Building Planning (Chapters 3-6)
 - Fire Protection (Chapters 7-9)
 - Means of Egress (Chapter 10)
 - Miscellaneous (Other Chapters)
 - 527 CMR (NFPA 1) Adoption Changes
- Questions & Comments




Adoption Schedule

- Draft approved by the BBRS on Nov. 10th
- Next Steps:
 1. Review by Building Code Coordinating Council.
 2. Review by Governor's Office per Executive Order 562.
 3. Public Hearing
 4. BBRS approves final content
 5. Secretary of State establishes effective date




Occupancy Classification of Commercial Kitchens


- 2012-303.3 (Clarification)
 - Commercial kitchens associated with restaurants are considered a Group A-2 Occupancy
- 2012-306.2 (Clarification)
 - Commercial kitchens associated with food processing greater than 2,250 SF are considered a Group F-1 Occupancy
- 2015-304.1 (Modification)
 - Unassociated commercial kitchens less than 2,250 SF are considered a Group B occupancy (Small Bakeries/Carry out Pizza)






Training and Skill Development Facilities

- 2015-304.1 (Clarification) – Use Group B
 - Training and skill development not in a school or academic program (this shall include, but not be limited to, tutoring centers, martial arts studios, gymnastics and similar uses regardless of the ages served, and where not classified as a Group A occupancy).



Classification of Accessory Storage Spaces


- 2015-311.1 (Modification)
 - Storage rooms less than 100 SF accessory to the main building occupancy are classified as part of the main occupancy
 - Accessory storage spaces are not to be included in the calculation for the 10% maximum accessory use spaces as outlined in Section 508.2 as they are classified as part of the main occupancy and not classified separately

High-Rise Buildings-Fire Service Access Elevators

- 2012-403.6.1 (Modification)
 - In buildings with occupied floors greater than 120 feet above FD vehicle access, at least 2 fire service elevators must be provided with a capacity of at least 3500 lbs
 - Elevators can open into same elevator lobby (3007.6.4)
 - Elevators can be located in same hoistway (3002.2)
 - Previously: 1 Fire service elevator required in such buildings

Enclosure of Atriums

- 2015-404.6 (Modification)
 - Doors in glass atrium walls are permitted to be glass provided they are protected by sprinklers consistent with the requirements for atrium glass walls.
 - Previously: Doors in glass atrium walls were required to be fire rated.

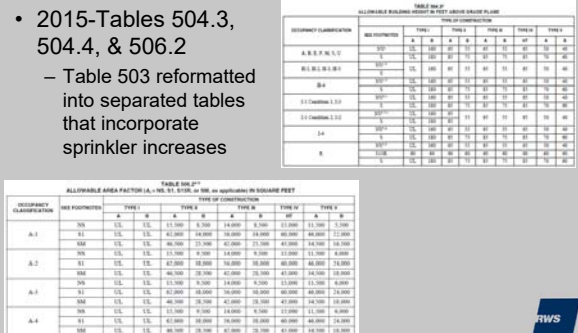


Inside Storage, Dispensing, and Use of Hazardous Materials

- 2012-414.5 (Clarification)
 - Scoping provisions for hazardous materials altered to better coincide with the IFC
- 527 CMR (NFPA 1) Section 1.1
 - M.G.L., 780 CMR, and other specialized codes shall be adhered to in the design and construction of buildings, structures and equipment. The rules and regulations of such codes is not enforced by the AHJ but rather the appropriate enforcement official
 - 527 CMR 1.03(2) states the scope to include the rules and regulations to prescribe the location, materials and construction of buildings used for the storage, use, manufacture, sale, handling and transportation of a list of hazardous materials

Building Height and Number of Stories

- 2015-Tables 504.3, 504.4, & 506.2
 - Table 503 reformatted into separated tables that incorporate sprinkler increases



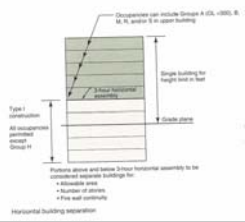

Mezzanine Openness

- 2015-505.2.3 Exception 2 (Modification)
 - Mezzanines not open to the room they are located in are not required to have direct access to an exit provided the mezzanine has two or more exits or access to exits





Horizontal Building Separation

- 2015-510.2 (Modification)
 - In pedestal buildings, the portion below the three hour separation is not limited to one story above grade plane
 - Lower building can be any occupancy except Group H
 - Maximum building height in feet shall not exceed limits set forth for the building having the smaller allowable height measured from grade plane (85' for Type IIIA)
- Previously: Portion below the three hour separation limited to one story above grade plane.


Fire Resistance for Building Elements

- 2015-Table 601, note D (Deletion)
 - Removal of the allowance for an approved automatic sprinkler system to replace one hour structural fire rating in Type IIA, IIIA and VA buildings when a sprinkler system was not otherwise required by other provisions of the code. The footnote was seen to have very limited applicability





Fire Ratings of Exterior Walls

- 2012-Table 602, Note h (Modification)
 - Nonbearing exterior walls permitted to have unlimited unprotected openings based on Table 705.8 are permitted a fire resistance rating of 0 hours based on FSD
 - Previously: Some exterior walls with between 20'-30' of FSD required to have at least a 1 hour fire resistance rating but were permitted to have unlimited openings





Fire Protection (Chapters 7-9)


Establishing Fire Resistance Ratings

- 2012-703.4 (Clarification)
 - A fire suppression system is not to be included in the testing of an element, component, or system in order to establish its fire resistance rating
 - Section 104.11-Building official can approve alternative materials, designs or methods of construction
 - Previously: Specific language did not prohibit a fire suppression system to be used in test to establish rating


Identification of Fire and Smoke Separation Walls

- 2012-703.7
 - Must be marked within 15 feet of the end of each wall and every 30 feet in between. 3" high letters
 - Previously: Markings every 30 feet with 1/2" high letters



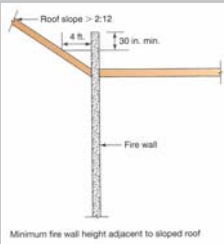
Fire Wall Structural Support

- Fire walls must be designed to allow for collapse on either side without the wall collapsing under fire conditions. Fire walls constructed per NFPA 221 deemed to comply.
 - Cantilevered Fire Walls
 - Tied Fire Walls
 - Double Fire Walls
 - Door openings must be protected with a vestibule



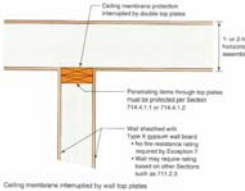
Fire Wall Height at Sloped Roofs

- 2012-706.6 & 706.6.2 (Addition)
 - Buildings with interior fire walls and roofs sloped towards the fire wall at slopes greater than 2:12 must have a minimum parapet height of 30" above height of roof within 4'



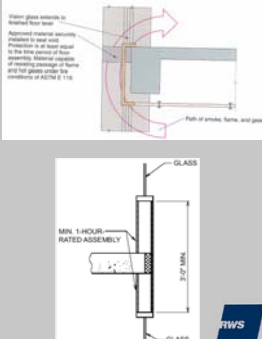
Interruption of Horizontal Assemblies

- 2015-714.4.2 (Modification)
 - Ceiling membrane of a 1 or 2 hour rated floor/ceiling or roof/ceiling assembly is permitted to be interrupted by a double wood top plate of a wall assembly sheathed in Type X gypsum wallboard



Exterior Curtain Wall/Floor Intersection

- 2012-715.4 (Modification)
 - voids at the intersection of exterior curtain walls and floors, where the vision glass extends to the floor assembly, are permitted to be filled with an approved material that is tested according to ASTM E119
 - Previously: code referenced ASTM E 2307: Fire Resistance of Perimeter Fire Barriers



Marking of Fire-Rated Glazing Assemblies

- 2012-716.3 (Clarification)
 - Table 716.3 added to define and relate various testing methods and the proper markings for the fire rated glazing

FIRE TEST STANDARD	MARKING	DEFINITION OF MARKING
ASTM E 119 or UL 263	W	Meets wall assembly criteria
NFPA 257 or UL 9	OH	Meets fire window assembly criteria including the hose stream test
NFPA 252 or UL 10B or UL 10C	D	Meets fire door assembly criteria
	H	Meets fire door assembly hose stream test
	T	Meets 450°F temperature rise criteria for 30 minutes
	XXLX	The time in minutes of the fire-resistance or fire protection rating of the glazing assembly

For 32 °C = [(°F) - 32] 1.8

Fire-Protection-Rated Glazing

- 2012-Table 716.6 (Clarification)
 - Table 716.6 now includes required markings for fire rated glazing
 - Previously: Table only includes window ratings

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE-RATED GLAZING MARKING
Interior walls	A-3	1/2	W-XXX
Fire walls	-1	1/2	W-XXX
Fire barriers	1	1/2	W-XXX
Decomposed rock areas (Section 707.3.7)	0.5	1/2	016-41 or W-40
Minimal emergency egresses (Section 707.3.8)	1	1/2	016-41 or W-40
Fire partitions	1	1/2	016-41 or W-40
Smoke barriers	1	1/2	016-41 or W-40
Exterior walls	-1	1/2	016-41 or W-XXX
	1	1/2	016-41 or W-40
Roof wall	0.5	1/2	016-20 or W-10
Roof	A-3	1/2	See Appendix

W-XXX is not permitted.
 a. Not permitted except for restricted roof glazing assemblies used in ASTM E 119 or UL 263, as specified in Section 716.3.
 b. XXXX - The fire rating duration period in minutes. Which shall be equal to the fire-resistance rating required for the wall assembly.



Wired Glass in Fire Window Assemblies

- 2012-716.6.4 (Deletion)
 - Wired glass not compliant with the test standards for fire protection rated glazing is no longer permitted

Ducts Transitioning Between Shafts

- 2015-717.1.1 (Clarification)
 - Ducts are permitted to exit a shaft, transition horizontally, and enter another shaft enclosure without being protected horizontally, provided the shafts are protected with the appropriate dampers

Plenum Construction



- 2015 IBC-703.5 and 2015 IMC-602.2 (Clarifications)
 - Regardless of building construction classification, plenums are required to be bounded by non-combustible materials or materials with flame-spread/smoke developed index of 25/50 where exposed to airflow (typically return air)

Sprinkler Systems

- Deleting/reducing MA specific thresholds for sprinklers, etc. and using base IBC thresholds
- M.G.L. Chapter 148 Section 26G still applies



Carbon Monoxide Detection

- 915-2015
 - Carbon Monoxide Detection
 - Occupancies required
 - Dwelling units, sleeping units and classrooms that contain a fuel burning appliance or fireplace
 - Dwelling units, sleeping units and classrooms served by a fuel burning, forced air furnace, with exceptions
 - Dwelling units, sleeping units and classrooms located in buildings that contain fuel burning appliances or fireplaces, with exceptions
 - Dwelling units, sleeping units and classrooms located in buildings with attached, private garages, with exceptions






Carbon Monoxide Detection

- 2015-915 (Modification)
 - Carbon Monoxide Detection
 - Locations required
 - In dwelling units outside each separate sleeping area
 - In sleeping units if the bedroom or attached bathroom has a fuel burning appliance installed
 - In classrooms in Group E occupancies with automatic alarm signals transmitted to on site location staffed by school personnel
 - Power source
 - Hard wired with battery backup
 - Combination Alarms
 - Combination Smoke/CO alarms permitted when listed accordingly
 - Carbon Monoxide Detection Systems
 - Permitted as an alternative to alarms when compliant with NFPA 270 and listed accordingly


Means of Egress (Chapter 10)

Chapter 10 Table of Contents


2009 International Building Code (IBC)	2015 International Building Code (IBC)
1001-Administration	1001-Administration
1002-Definitions	1002-Definitions
1003-General Means of Egress	1003-General Means of Egress
1004-Occupant Load	1004-Occupant Load
1005-Egress Width	1005-Means of Egress Sizing
1006-Means of Egress Illumination	1006-Number of Exits and Exit Access Doorways
1007-Accessible Means of Egress	1007-Exit and Exit Access Doorway Configuration
1008-Doors, Gates and Turnstiles	1008-Means of Egress Illumination
1009-Stairways	1009-Accessible Means of Egress
1010-Ramps	1010-Doors, Gates and Turnstiles
1011-Exit Signs	1011-Stairways
1012-Handrails	1012-Ramps
1013-Guards	1013-Exit Signs
1014-Exit Access	1014-Handrails
1016-Exit and Exit Access Doorways	1015-Guards
1016-Exit Access Travel Distance	1016-Exit Access
1017-Aisles	1017-Exit Access Travel Distance
1018-Corridors	1018-Aisles
1019-Egress Balconies	1019-Exit Access Stairways and Ramps
1020-Exits	1020-Corridors
1021-Number of Exits and Continuity	1021-Egress Balconies
1022-Exit Enclosures	1022-Exits
1023-Exit Passageways	1023-Interior Exit Stairways and Ramps
1024-Luminous Egress Path Markings	1024-Exit Passageways
1025-Horizontal Exits	1025-Luminous Egress Path Markings
1026-Exterior Exit Ramps and Stairways	1026-Horizontal Exits
1027-Exit Discharge	1027-Exterior Exit Stairways and Ramps
1028-Assembly	1028-Exit Discharge
1029-Emergency Escape and Rescue	1029-Assembly
	1030-Emergency Escape and Rescue

BOLD=NEW



Cumulative Occupant Loads

- 2015-1004.1.1 (Modification)
 - When occupants egress through one or more rooms or spaces through other rooms or spaces the occupant loads must be combined
- 2015-1004.1.1.3 (Modification)
 - Multiple stories not added together except for convergence from above and below level of discharge



Design Occupant Load-Areas without Fixed Seating

- 2012-Table 1004.1.2 (Modification)
 - Museums and exhibit galleries given an occupant load of 30 SF per occupant
- 2015-Table 1004.1.2 (Modification)
 - 60 SF/occupant in mercantile occupancies independent of floor level
 - *Basement and grade floor permitted 30 SF/occupant with 60 SF/Occupant on other floors*



Exits and Exit Access Doorways

- 2015-1006 (Modification)
 - Means of egress requirements for rooms, spaces, and stories consolidated in Chapter 10.
 - Table 1006.2.1 created to combine all requirements for spaces with one exit
 - I-3, R-1, R-2, R-3 spaces with one exit are required to be sprinklered
 - All else remain as is

Spaces with One Exit

- 2015-Table 1006.2.1

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		CL ≤ 50	CL > 50	
A, E, M	49	75	75	75*
B	49	100	75	100*
F	49	75	75	100*
H-1, H-2, H-3	3	NP	NP	25*
H-4, H-5	10	NP	NP	75*
I-1, I-2, I-4	10	NP	NP	75*
I-3	10	NP	NP	100*
R-1	10	NP	NP	75*
R-2	10	NP	NP	125*
R-3*	10	NP	NP	125*
R-4*	10	75	75	125*
S*	28	100	75	100*
U	49	100	75	75*

Stories with One Exit

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE
Basement, first, second or third story above grade plane	R-2*	4 dwelling units	125 feet
Fourth story above grade plane and higher	NP	NA	NA

STORY	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)
First story above or below grade plane	A, B, E, F, M, U	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R-1, R-2*, R-4	10	75
Second story above grade plane	S*	28	75
	B, F, M, S*	28	75
Third story above grade plane and higher	NP	NA	NA

Exit and Exit Access Doorway Configuration

- 2015-1007.1 (Modification)
 - Separation distance measured between
 - Any point along the width of the doorway for exits and exit access doorways
 - To the closest riser for exit access stairways
 - To the start of the ramp run for exit access ramps
 - Separation maintained for all portions of exit access stairways and ramps
 - When three or more are provided, at least two are required to comply

Door Swing


- 2012-1008.1.2 (Clarification)
 - Door swing is based on the total occupant load of the space, not on an assigned or distributed occupant load to specific doorways

Application of Stairway Provisions

- 2012-1009.1 (Clarification)
 - All stairways serving occupied portions of buildings must comply with section, not only those stairs designated as egress stairs


Door Operations-Locking Systems

- 2015-1010.1.9.7 Exception 5
 - I-2 and I-3 occupancies permitted to have 2 delayed egress locks in egress travel permitted the combined delay does not exceed 30 seconds




Floor-Level Exit Signs in Group R-1

- 2012-1011.2 (Addition)
 - Floor level exit signs are required in R-1 occupancies in the means of egress serving guest rooms when general use exit signs are also provided






Ladders

- 2015-1011.15 & 1011.16 (Addition)
 - Permanent ladders cannot serve as a part of the means of egress from occupied spaces but are permitted to provide access to the following locations when constructed according to the *IMC*
 - Spaces frequented by personnel for maintenance, repair, and monitoring of equipment
 - Non-occupiable spaces accessed by catwalks etc.
 - Raised areas such as fire towers
 - Elevators in Group U not open to general public
 - **Non occupied roofs not required to have stairway access unless roof has elevator equipment**



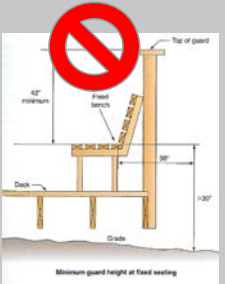

Guards at Operable Windows

- 2012-1013.1 & 1013.8 (Moved & Modification)
 - In use Groups R-2 and R-3, operable windows greater than 72" from grade and less than 36" from finished floor level must not be able to pass a 4" sphere through the opening
 - *Previously: Applied to operable windows less than 24" from finished floor level (2009 IBC 1405.13.2)*

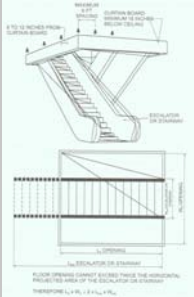

Guard Height

- 2012-1013.3 (Deletion)
 - Guard height is no longer measured vertically from adjacent fixed seating

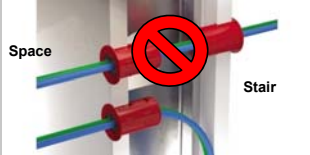

Exit Access Stairs

- 2015 IBC 1019.3: Open stairs > 2 stories, such as atriums and convenience stairs with draft curtains and closely space sprinklers, are permitted to be used for egress.
- However - Section 1006.3 states:
 - Path of egress travel to an exit shall not pass through more than one adjacent story.






Enclosure Penetration of Interior Exit Stairways

- 2012-1022.5 (Modification)
 - Membrane penetrations are permitted on the outside of interior exit stairway or ramp provided they are protected accordingly






Miscellaneous Changes


Mechanical Ventilation Required

- 2012-1203.1 (Addition)
 - When air filtration rate in a dwelling unit is less than 5 ACH, mechanical ventilation is required within the dwelling unit

NFPA 285

- Proposed MA Amendments:
 - Compliance with NFPA 285 would not be required in a low rise structure provided:
 - The building has sprinkler protection per NFPA 13
 - A fire flow analysis is conducted assuming no sprinkler protection
 - Compliance with NFPA 285 would not be required in walls which the water-resistive barrier is the only combustible component if the exterior wall is firestopped as follows:
 - At every floor level but not exceeding 20 feet vertically
 - Horizontal intervals not exceeding 40 feet



Stretch Energy Code


AA103 New buildings.

AA 103.1 R-use buildings. In all R-use buildings, of four stories or less above *grade plane* with one or more dwelling units, each *dwelling unit* shall comply with Section N1106 of 780 CMR 51 (Residential Code).

AA103.2 Large area and high energy use buildings. All buildings over 100,000 sq. ft. and new supermarkets, laboratories and conditioned warehouses over 40,000 sq. ft. shall comply with 780 CMR 13 and shall demonstrate energy use per square foot **at least 10% below the energy requirements of ANSI/ASHRAE/IESNA 90.1 APPENDIX G Performance Rating Method** on either a site or source energy basis.

AA103.3 Other new buildings. New buildings not covered in AA103.1 and AA103.2 shall comply with 780 CMR 13 or 780 CMR 51-Chapter 11 as applicable based on the use and occupancy of the building.

AA104 Existing buildings. For alterations, renovations, additions or repairs of existing buildings in these municipalities the energy efficiency requirements of 780 CMR 13 or 780 CMR 51-Chapter 11 shall be used as applicable based on the use and occupancy of the building.




Revolving Doors

- Adjacent doors need vestibules.

C402.5.7 Vestibules.
 Building entrances shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the building entrance shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors.

Exceptions: Vestibules are not required for the following:

- Buildings in Climate Zones 1 and 2.
- Doors not intended to be used by the public, such as doors to mechanical or electrical equipment rooms, or intended solely for employee use.
- Doors opening directly from a sleeping unit or dwelling unit.
- Doors that open directly from a space less than 3,000 square feet (296 m²) in area.
- Revolving doors.
- Doors that have an air curtain with a velocity of not less than 6.55 feet per second (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.






527 CMR (NFPA 1)



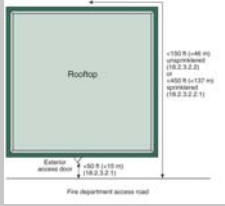
Fire Department Access

- 18.2.3.1.1-Fire department access road provided for every facility, building or portion thereof newly constructed or relocated
 - Roadways
 - Fire lanes
 - Parking lot lanes

Access to Buildings

- 18.2.3.2.1-Fire lane extends to within 50' of at least one exterior door opened from the outside providing access to the interior of the building
- 18.2.3.2.2-No portion of the building or portion of the exterior wall of the first story more than 150' from fire department access road (250' if sprinklered)
- 18.2.3.3-Fire official can approve alternatives if distance > 250'




Access Road Properties

- 18.2.3.4.1.1-20' width minimum (10' minimum if constructed boulevard style)
- 18.2.3.4.1.2-13'-6" height clearance




Questions?

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