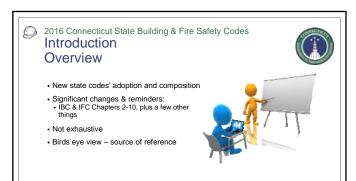


Office of Education and Data Management Fall 2016 Career Development Series

Significant Code Changes IFC & IBC Chapters 2 – 10 2016 Connecticut State Building & Fire Safety Codes

Terry Brouwer ~ OSFM

Darren Hobbs ~ OSBI







Introduction Model Codes & Supplement

- · Amendments of Model Codes
- ICC and NFPA model codes:
- http://codes.iccsafe.org/I-Codes.html#all
- http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-andstandards
- Printing of Codes ~ Errata by ICC ~ incorporated in:
- IBC (4th); IFC (3rd); IRC (7th); IMC (2nd); IEBC (5th)... or better



⊕ OSBI & OSFM -e Link to Amendment Documents





2016 Connecticut State Building & Fire Safety Codes

Introduction Tracking the Changes

- ICC's Significant Changes books: • Type
- Summary
- Significance
- The "CliffsNotes" for code officials
- 1000+ pages of change explanation in 2006, 2009 and 2012 volumes
- 2003 → 2006 → 2009 → 2012 Areas of refuge for example



Introduction 2016 State Fire Safety Code



Effective date: October 1, 2016

- IFC (2012)
- International Fire Code
- NFPA 101 (2012) Life Safety Code
- Construction codes vs fire prevention codes
- FPC is Operational & Maintenance Code







2016 Connecticut State Building & Fire Safety Codes

Introduction Referenced Standards

- IBC Ch.35 & IFC Ch.80 some are amended by CT supplement
- Only apply to extent called for by code
- IBC / IMC adds NFPA 31 Oil Burning Equipment Code
- State not adopting the International Fuel Gas Code:
- NFPA 54 ~ National Fuel Gas Code
- NFPA 58 ~ Liquefied Petroleum Gas Code
- NFPA 2 ~ Hydrogen Technologies Code
- NFPA 1124 ~ Retail Sales of Consumer Fireworks









2016 Connecticut State Building & Fire Safety Codes

Chapter 1 (IFC) Administration



- Alternative compliance with Part III
- 2012 International Existing Building Code
- Chapter 34 of IBC portion of State Building Code
- Existing portions not affected by alteration, addition or change of use must still meet Part IV of State Fire Safety Code





Chapter 2 **Definitions**



- ICC relocated all to Chapter 2 rather than throughout documents
- Bulk Merchandising Retail Building
- Exceeds 12,000 sf in area Storage of combustible on pallets, piles or racks in excess of 12 feet in height
- Social rehabilitation, substance abuse or mental health problems that provides custodial care but not acute care.



2016 Connecticut State Building & Fire Safety Codes

Chapter 2 **Definitions**



- Congregate living facilities (2006 S. 301.2)
- Sleeping units where the residents share bathroom and/or kitchen facilities
- Transient more than 6 = R-1
- Non-transient more than 6 = R-2
- 6 or less without personal care services = R-3
- >• 4 to 16 with personal care services = R-4
- Personal care services = do not require medical care
 Custodial care services = assistance with day-to-day activities i.e., cooking, taking meds, bathing, using toilets.



2016 Connecticut State Building & Fire Safety Codes

Chapter 2 **Definitions**



- Reminder: Single family can have not more than 6 lodgers or boards not receiving personal care ~ found in:
- IBC & IFC 310.5,
- IRC, Chapter 2, Definitions.
- Incapable of self-preservation
- Can't respond as an individual to an emergency situation

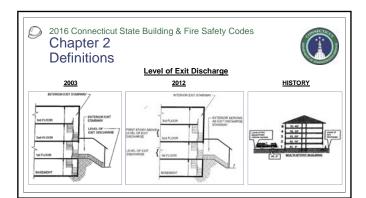






- Special Amusement Building (CT Amd)
- Added exception for small child play structures
- 10 ft in height & 300 sf aggregate horizontal area





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2016 Connecticut State Building & Fire Safety Codes

Chapter 3 Use and Occupancy Classification



- \bullet Part III \sim IFC has adopted Chapter 3 of the IBC
- Assembly A-2 (2009 Sec. 303.3)
- Casino gaming areas
- Restaurants, <u>cafeterias</u>, <u>and similar dining facilities</u>
 (including associated commercial kitchens)



Chapter 3

Use and Occupancy Classification



- Business
- Ambulatory health care facility (2009 Sec. 304.1 to Sec. 202)
- Clinic-Outpatient (2009 Sec. 304.1.1)
- Factory Industrial (2009 Sec. 306.2)
- Food processing and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities



2016 Connecticut State Building & Fire Safety Codes

Chapter 3

Use and Occupancy Classification



- 2009 Table 307.1(1) & 307.4
- Added combustible dusts where manufactured, generated or used in a manner that the concentration and conditions create a fire or explosion hazard



2016 Connecticut State Building & Fire Safety Codes

Chapter 3 Use and Occupancy Classification

- Definition of care facilities (2009 308.2, 202)
 - · 24-hour care
 - Child Foster care facility
 - · Incapable of self preservation
 - Medical care



Chapter 3

Use and Occupancy Classification



- I-4 ~ Adult care facility (2009 Sec. 308.5.1)
- Where able to respond without physical assistance
- Now R-3 ~ was A-3
- Residential ~ Live/Work Units (2009 Sec. 310.1)
- Sec. 419
- Storage
 Dry (indoor) boat storage = Group S-1 Moderate hazard (2006 Sec. 311.2)



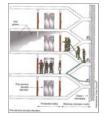
2016 Connecticut State Building & Fire Safety Codes

Chapter 4

Special Requirements Based on Use & Occupancy



- Fire service access elevator (S.403.6.1)
- New requirement added in 2009 IBC, amended in 2012 IBC
- Buildings with occupied floor >120 feet
- All or two of the elevators (which ever is less) must meet 3007 detailed requirements





2016 Connecticut State Building & Fire Safety Codes

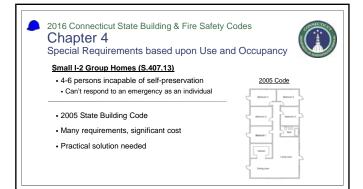
Chapter 4

Special Requirements Based on Use & Occupancy

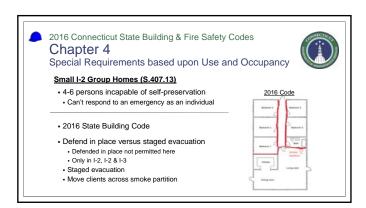


- \bullet Part III ~ IFC has adopted Chapter 4 of the IBC
- Outdoor storage of hazardous materials (2006 Sec. 414.6.1)
- Allows weather protection but still be considered outdoor storage or use areas











Special Requirements Based on Use & Occupancy

- Sec. 419 ~ Live / Work Units
- Dwelling unit where significant portion is not residential
- · Classified as R-2
- Doesn't apply if less than 10% of dwelling unit
- Size, location & employee limitations



2016 Connecticut State Building & Fire Safety Codes Chapter 4





- Sec. 422 ~ Ambulatory Care Facilities
- Our old Group B Medical... still Group B
 Was CT amendment (Ch.3), now in model code
- Mixed use / multi tenant buildings
- Smoke compartments
- Sec. 423 ~ Storm Shelters
- Introduced into IBC by ICC in 2009
 References ICC/NSSA Standard ICC 500-2008





2016 Connecticut State Building & Fire Safety Codes

Chapter 4

Special Requirements Based on Use & Occupancy



- Sec. 424 ~ Children's Play Structures
- Not a Special Amusement Building
- See definition (CT Amd)
- Greater than 10 feet in height & 300 square feet in area
- Within a building
- Max 10 feet in height & 150 square feet in area
- Construction materials are regulated







Special Requirements Based on Use & Occupancy

- Sec. 425 ~ Location of Group E Occupancies
- Includes libraries, cafeterias, gymnasiums and multipurpose rooms
- Not administrative offices, health care & special one-on-one rooms
- Dedicated means of egress = stairway from room





2016 Connecticut State Building & Fire Safety Codes

Chapter 5 (IFC) Fire Service Features



- Sec. 504 ~ Access to building openings & roofs
- · Typically exit discharge doors
- Exterior doors that are not functional shall be marked
- Roof access repeated from Sec. 1009.16
- Sec. 508 ~ Fire Command Center
- Relocated from Chapter 9
- Typically high-rise



2016 Connecticut State Building & Fire Safety Codes

Chapter 5 (IFC)

Fire Service Features

- Sec. 511 ~ Vehicle Impact Protection
- Any references to Sec. 312 mean here
- Sec. 512 ~ Hazards to Firefighters
- Shaft markings
- Obstructions on roofs at least 7ft above surface
- Limits construction in the utility easement beneath high voltage lines





2016 Connecticut State Building & Fire Safety Codes Chapter 5 (IFC)

Fire Service Features



- Sec. 513 ~ Rooftop Gardens and Landscaped Roofs
- · Limited in size & distance between areas
- Maintenance plan for vegetation



2016 Connecticut State Building & Fire Safety Codes

Chapter 5 (IBC) General Building Heights and Areas



• 501.2 Address Identification Multiple locations

• 502.1 <u>Basement</u> 202 Change in definition Not a story above grade plane

• 502.1 Story above grade plane
202 Change in definition

"Story above grade plane. Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is: 1. More than 6 feet above grade

- plane; or

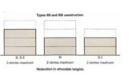
 More than 12 feet above the finished ground level at any point."

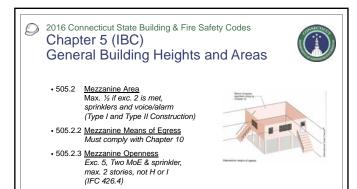
2016 Connecticut State Building & Fire Safety Codes

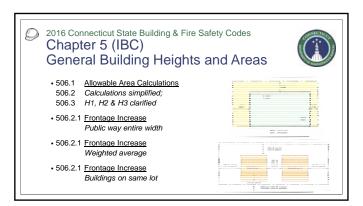
Chapter 5 (IBC) General Building Heights and Areas

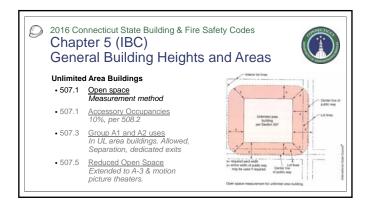


- Allowable Height
 Reduction for B, M, S-1, S-2 • 503 in Type IIB and Type IIIB
- 503.1.1 <u>Unlimited Height & Area</u> Includes special industrial occupancies

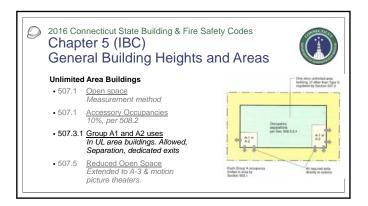


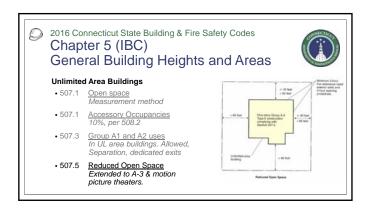


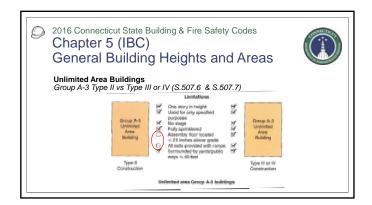


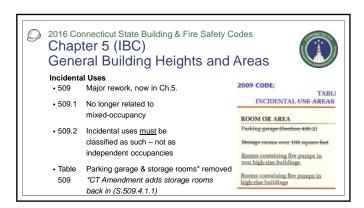


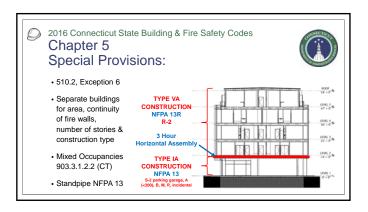














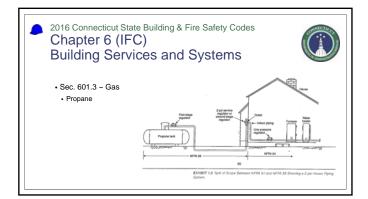




- Sec. 601.3 ~ Gas
- Adopting NFPA 54, 58 & 2 ~ not IFGC
- NFPA 2 captures all hydrogen issues
- IBC Section 101.4
- BO & FM deal with NFPA 54 & 2
- FM to handle NFPA 58 except IRC



2016 Connecticut State Building & Fire Safety Codes Chapter 6 (IFC) Building Services and Systems	
Sec. 601.3 ~ Gas Propane & natural gas NEPASI_NEPASI From gas main EXHIBIT 1.1 Code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply. **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply and Typical Natural Gas Supply.** **The code Autsdictions for Typical Propane Supply Su	







- Sec. 605.11 ~ Solar Photovoltaic Power Systems
- Hazards:
- Dead load weights on roofs
- · Potential for electrical shock
- Requirements for:
- Marking
- Pathways on roof
- Roof access points



2016 Connecticut State Building & Fire Saf Chapter 7 Fire & Smoke Protection Formula	
• Part III ~ IFC has adopted Chapter 7 of the I	ВС
 Assists FM in maintenance inspections 	Elevator High-ray hulding at each floor
 Sec. 702.1 ~ Definitions Fire Barrier Horizontal Assembly 	Elector series for treat
 Elevator lobby egress ~ 713.14.1 At least one means of egress per Chapter 10 	none fair 73 fz. stone toward well as a fair of the department with access with the access of the department with the access of the department of the access of the acces
Sec. 712.1.12 Unenclosed stairs and ramps Convenience only a not exit stairways	2 % since toward of the department of the depart

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2016 Connecticut State Building & Fire Safety Codes

Chapter 7

Fire & Smoke Protection Features



- Identification of fire and smoke separation walls (703.7)
- Accessible concealed floor, ceiling, attic
- <15' of wall ends & every 30'
- Letters 3", contrasting color
- "Fire and/or Smoke Barrier Protect All Openings" or other wording.



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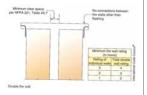
) 2016 Connecticut State Building & Fire Safety Codes

Chapter 7

Fire & Smoke Protection Features



- Double fire walls (706.2)
- Now permitted as alternative to single fire wall.
- Must comply with NFPA 221
 Standard for High Challenge Fire Walls,
 Fire Walls and Fire Barrier Walls
- Minimum space between walls
- Minimum space between walls
 No connection except flashing



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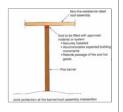
2016 Connecticut State Building & Fire Safety Codes

Chapter 7

Fire & Smoke Protection Features



- 707.9 <u>Voids at Intersections</u> 12 Fire barriers at nonrated roofs
- <u>ASTM E 2837</u>: Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies



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2016 Connecticut State Building & Fire Safety Codes

Chapter 7

Fire & Smoke Protection Features



- Vertical Openings Shaft Enclosures (S.712)
- Major reformatting
- Clarity on other methods to protect vertical openings.
- Unenclosed stairs and ramps (CT 712.1.12)
- Cross reference to 1009.2: Interior Exit Stairways
- CT deleted 1009.3: Exit Access Stairways



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) 2016 Connecticut State Building & Fire Safety Codes

Chapter 7





- Elevator lobbies (713.14.1)
- Major rework and increase in requirements
- Required where elevator connects more than three stories.
- Fire partition or smoke partition if sprinklered
- 7 exceptions.
- Serving floor over 75-feet, no exception
- Pressurize elevator hoistways as alternative

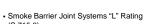


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2016 Connecticut State Building & Fire Safety Codes

Chapter 7

Fire & Smoke Protection Features



- (S.715.6)
- Air leakage rate ambient & elevated temps
 UL 2079
- 5 CFM per linear foot... at 0.30 inch of water
- Fire damper exemption for fire partitions (S. 717.5.4, exc. 4)
- Mirrors existing exemption for fire barriers
- For fire dampers only; not smoke dampers



Chapter 8 Interior Finishes



- Part III ~ IFC has adopted Chapter 8 of the IBC
- Sec. 803.1 ~ Textile wall and Ceiling finishes
- Test method per NFPA 286, or
- ASTM E84 or UL 723 if protected by automatic fire sprinklers
- Sec 803.12 ~ High-density polyethylene (HDPE) or polypropylene (PP)
- Must meet NFPA 286



2016 Connecticut State Building & Fire Safety Codes

Chapter 9 Fire Protection Systems



- 903.1.1 Alternative Protection (in lieu of fire sprinklers)
- Character of fuel cannot mix with water



2016 Connecticut State Building & Fire Safety Codes

Chapter 9 Fire Protection Systems



- Restaurants, Banquet halls, Night clubs, Taverns & bars
- Threshold fire area = 5,000 square feet
- Exception = 12,000 square feet for previously designated A-3 (prior to 2005 State Codes)
- Threshold occupant load lowered to 100 persons in base code (2006)
- Station Night Club ~ Rhode Island
- Kept at 300 persons
- Lowered to 100 persons for Dance halls; Discotheques; Night clubs; Festival seating (see definitions)





Chapter 9 Fire Protection Systems

· Upholstered furniture and mattresses,

new trigger limits for sprinkler requirement: • Manufacture (F-1, 903.2.4) 2,500 sq.ft. Display (M, 903.2.7) 5,000 sq.ft Storage (S-1, 903.2.9) 2,500 sq.ft

• Reminder: CT amendment for stories below level of exit discharge with combustible goods or merchandize: 2,500 sq.ft. trigger limit. (Group M)





2016 Connecticut State Building & Fire Safety Codes

Chapter 9

Fire Protection Systems

Use Group R

- All required to be protected by automatic fire sprinklers $\sim 903.2.8\,$
- Previous exceptions remain
- New Exception #5 for mixed use with maximum 2 dwelling units
- Direct independent exit to grade from each dwelling unit
- Exit(s) and dwelling unit(s) separated from non-residential by 1-hour
- Non-residential protected by fire detection and alarm in dwelling units





2016 Connecticut State Building & Fire Safety Codes

Chapter 9

Fire Protection Systems

- Draft stopping per NFPA 13
- 903.3.1.1.2 ~ Not required unless being used as vertical opening protection per 712.1.3.1
- Use of NFPA 13R in mixed use buildings
- Prohibited by 2009 Amendment 903.3.1.2.2
 Exception when using horizontal assembly per 508.2 of SBC
- 2013 NFPA 13R ~ if sprinklers are driven by the Group R fire area
- Convert from NFPA 13 to NFPA 13R
- Check with BO
- One story / 20 feet increase in height 13 & 13R
- Area increase only for 13



Chapter 9

Fire Protection Systems

- Sec. 906 ~ Portable fire extinguishers
- Pointer to CT State Fire Prevention Code
- · Required by referenced standards
- Required by IFC
- · Special Occupancies
- · Hazardous Materials
- Sec. 907.2.6 ~ Automatic smoke detection in I-1 & I-2 (2006)



2016 Connecticut State Building & Fire Safety Codes

Chapter 9 Fire Protection Systems

- The Frotection dystems
- Sec. 907.2.9 ~ Fire alarm systems in R-2 • Eliminated the one manual pull if sprinklered.
- No appropriate place to locate it
- Monitoring / Emergency forces notification
- Previously CT Add 907.9.3
- Now in 907.6.5 for fire alarm systems
- Now in 903.4.1 for fire sprinkler systems
- NFPA 72 Sec. 26.3.7 requires immediate retransmission of alarm to the public service communications center (PSAP)

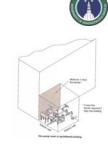




2016 Connecticut State Building & Fire Safety Codes

Chapter 9 Fire Protection Systems

- Sec. 913.6 (CT) ~ Electric fire pumps shall be attached to standby power
- If building has a generator, and
- Continued operations are planned
- (Sec. 913.2.1) Protection of fire pump rooms
- 1 hour fire barrier or 2 hour fire barrier in high rise



Chapter 9

Fire Protection Systems

- Sec. 915 ~ Carbon Monoxide Detection ~ Group E
 occupancies
- Required by CGS 29-292 ~ PA 11-248 effective July 1, 2011
- Exceptions:
- Rooms with cooking appliances
- Rooms with of Laboratories
- · Maintenance spaces
- \bullet CO Alarms/Detectors meet UL 2034 or UL 2075
- CO detector systems shall be connected to fire alarm system
- Supervisory alarm only



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2016 Connecticut State Building & Fire Safety Codes

Chapter 9

Fire Protection Systems

- Sec. 915 (CT) ~ Carbon Monoxide Detection ~ Group E occupancies
- Locations
- on the ceiling of rooms containing permanently installed fuelburning heating equipment
- centrally located within the first room or area served the first supply register on each main duct leaving a fuel-burning, forced air furnace
- Power supply
- Hardwired to building power with battery backup
- No battery or plug-in equipment





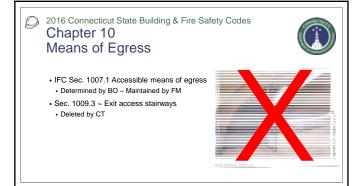


2016 Connecticut State Building & Fire Safety Codes

Chapter 10 Means of Egress



- Sec. 1003.8 ~ Security devices
- Prohibited to obscure means of egress
- Balanced Egress
- Sec. 1005.1.1 of 2009 Amendments
- Reverted to base documents
- Sec. 1005.5 ~ loss of any one exit will not reduce capacity to below ½
- Sec. 1005.3 ~ Egress capacity
- Don't get an increase for "wet" people





Chapter 10 Means of Egress



- Sec. 1011.2 Floor-level exit signs (was Floor Proximity Exit Signs)
- Expanded occupancies to where people sleep R-1 (Except B&B), R-2 and I-2
- No longer applies to Group A, Group B Medical, I-1
- Sec. 1020.3 Group M occupancies
- If customer entrance only through one wall ~ ½ capacity on that wall
- Exception for bulk merchandising





2016 Connecticut State Building & Fire Safety Codes

Chapter 10 Means of Egress



- Sec. 1021.2 ~ Exits from stories
- Used to be exits from buildings
- Sec. 1022.5 & 1023.6 ~ Penetrations of exits
- Now includes security systems
- Sec. 1024.6 Luminous Egress Path Markings Statutory Requirements for Exit Access Corridors
- Only on one side unless exceeds 120" in width







- · Now contained in both Codes
- Exceeding 400sq.ft. with exceptions
- Phasing out "Tent & Portable Shelter Code"
- Working with DCP as it's their regulation now
- Cooking deferred to IFC
- Allowing grease-laden vapors under a tent
 IFC says no
- DPH says you must protect elements
- Spark producing not allow under a tent





- · Addresses:
- Separation within occupied buildings for construction effort
- On the same floor by 1 hour or as per AHJ
- Temporary heating
- FD vehicle access
- Means of egress
- Standpipes



