

2018 Code Change Training

Virginia Construction Code and IBC

Jack A Proctor Virginia
Building Code Academy

Department of Housing
and Community Development



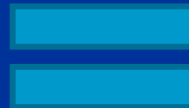
Welcome!

- Break schedule
- 100% attendance
- Participation



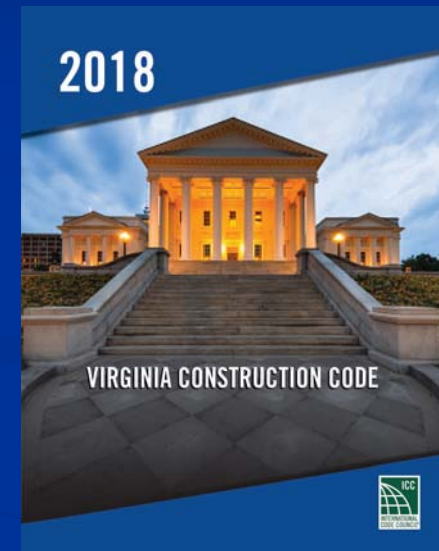
Agenda

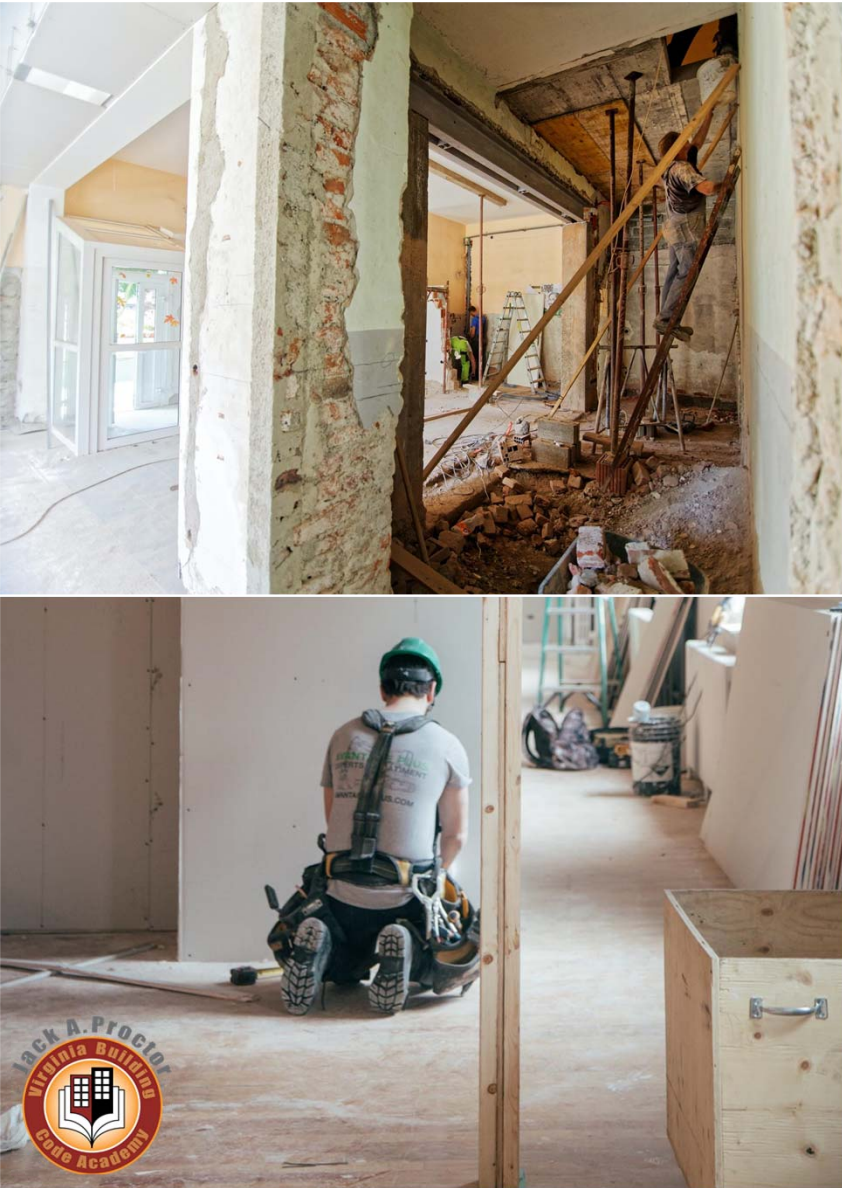
- Virginia Construction Code and International Building Code overview
- Significant international changes and state amendments
- State changes are marked in yellow with icon below



State Level Change

Virginia USBC and IBC





202 (Definitions) Wall

- "Wall" definition revised
- A vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space

State Code Change



202 Greenhouse

- New addition for greenhouse
- Corresponds to many related changes
- Can be several use groups depending on use
- Does not automatically kick in farm exemption



202 Repair Garage

- IFC definition ported over for alignment



202 Sleeping Unit

- Clarifies that each individual bedroom within a residential suite is not to be considered as a sleeping unit;
- Rather the entire suite is to be deemed as one sleeping unit

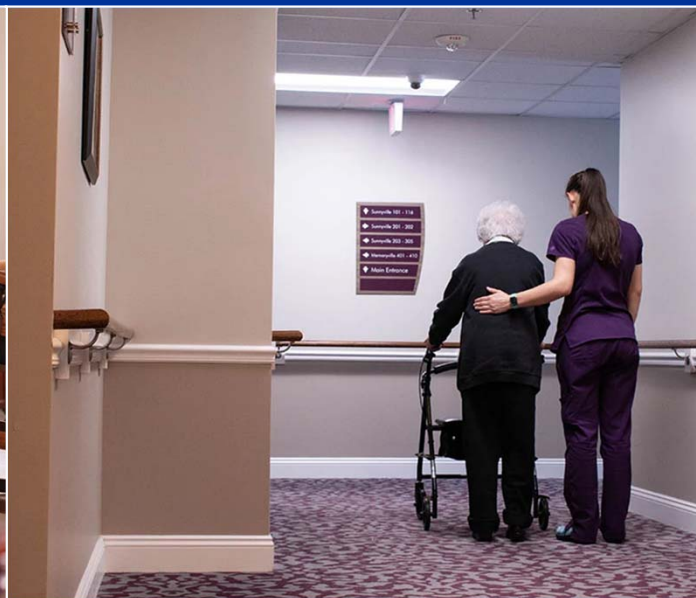


202 Gaming; Gaming Area; Gaming Machine Type; Gaming Table Type

- New definitions added related to casino gaming
- Relates to 1109.15, which sets accessibility requirements for such areas and machines

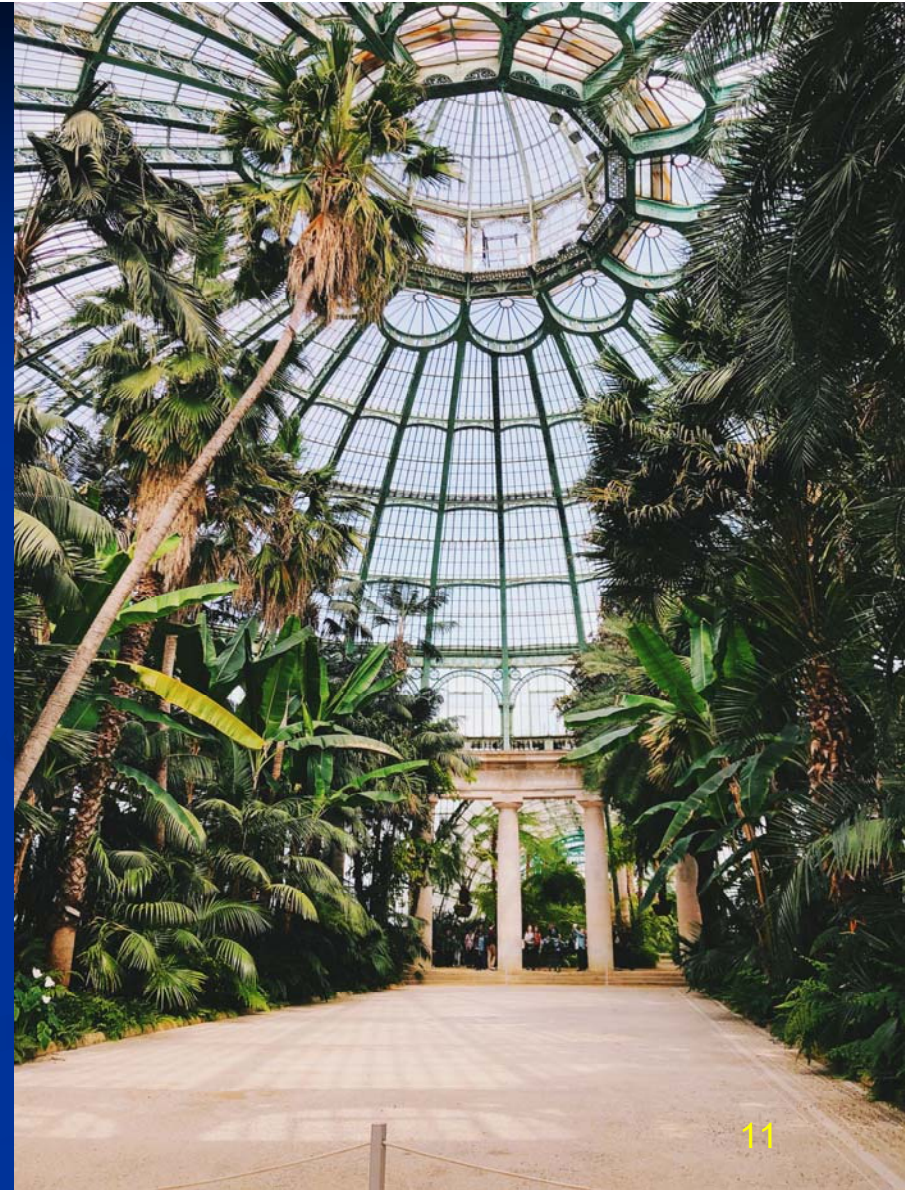
302.1; 308.3; 310.3 through 310.10; 313; 427.2 Group I, Group R, and Site Work for Manufactured Homes

- Clarifies R and I use group descriptions eliminating laundry lists
- Consolidates provisions for state licensed facilities
- Manufactured Homes classified as R-5
- Correlates VCC and SFPC



303.4 Assembly use of greenhouses classification

- Greenhouses for public viewing is A-3



309.1 Mercantile use of greenhouses classification

- Greenhouse provided with public access for display and sale of plants is Group M



311.1 Classification of accessory storage spaces

- Regardless of size, storage rooms and storage spaces that are accessory to other uses are to be classified as part of the occupancy to which they are accessory



311.2 Classification of self-service storage facilities

- Now classified as S-1



312.1 Classification of communication equipment structures

- If under 1,500 sqft can now be classified as U





312.1.1 Classification of agricultural greenhouses

- Greenhouses are Group U if not something else, and not exempted as farm structure



403.2.1.1 Type of construction in high-rise buildings

- No longer applicable to Groups H-2, H-3 and H-5 (in addition to F-1, M, S-1)
- Other occupancies are still permitted to be reduced to fire-resistance ratings in Type IIA

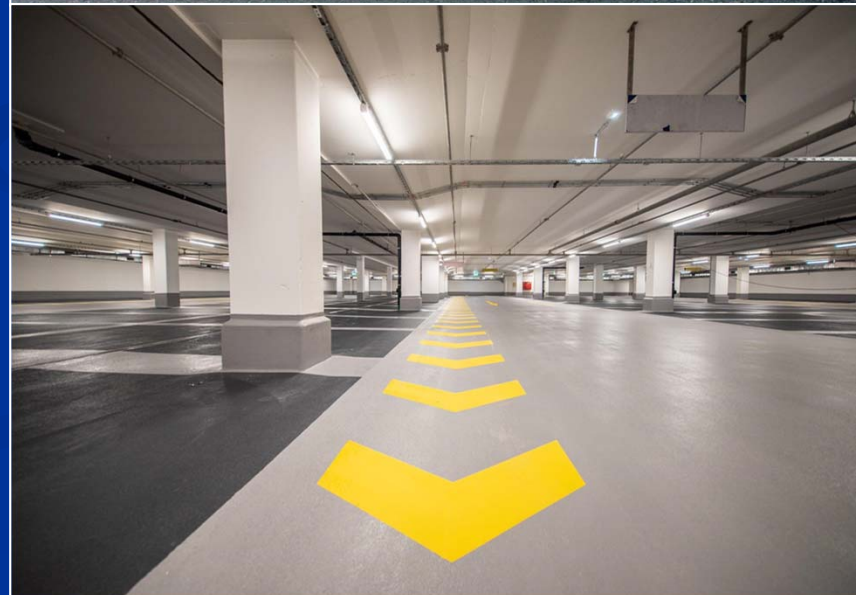


404.6 Enclosure of atriums

- New exception #4
- Fire barrier not required between the atrium and adjoining spaces where the atrium is not required to be provided with a smoke control system

406 Motor-vehicle-related occupancies

- Major overhaul of motor vehicle related occupancy provisions
- Requirements gathered from other sections
- Some private garages can meet provisions for public garages as alternative approach (406.3)
- Parking garages accessory to 1-2 family dwellings are exempted from ventilation requirements (406.6.2)



407.5 Maximum smoke compartment size

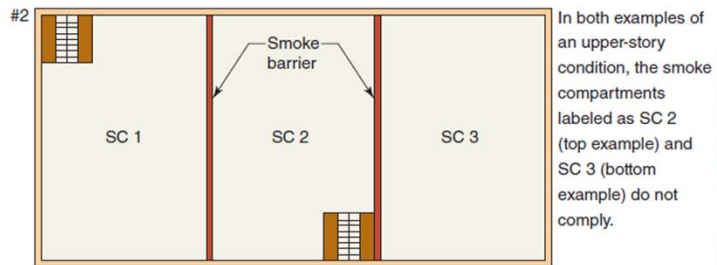
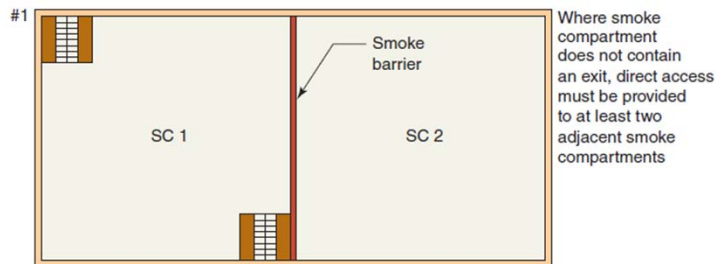
- Regardless of size, there must be at least 2 smoke compartments in hospitals and other Group I-2, Condition 2 occupancies



407.5.4 Required egress from smoke compartments

- Each smoke compartment must have an exit out of the building
- Direct access to not less than 2 adjacent compartments

Noncompliant Examples:



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Egress from smoke compartments

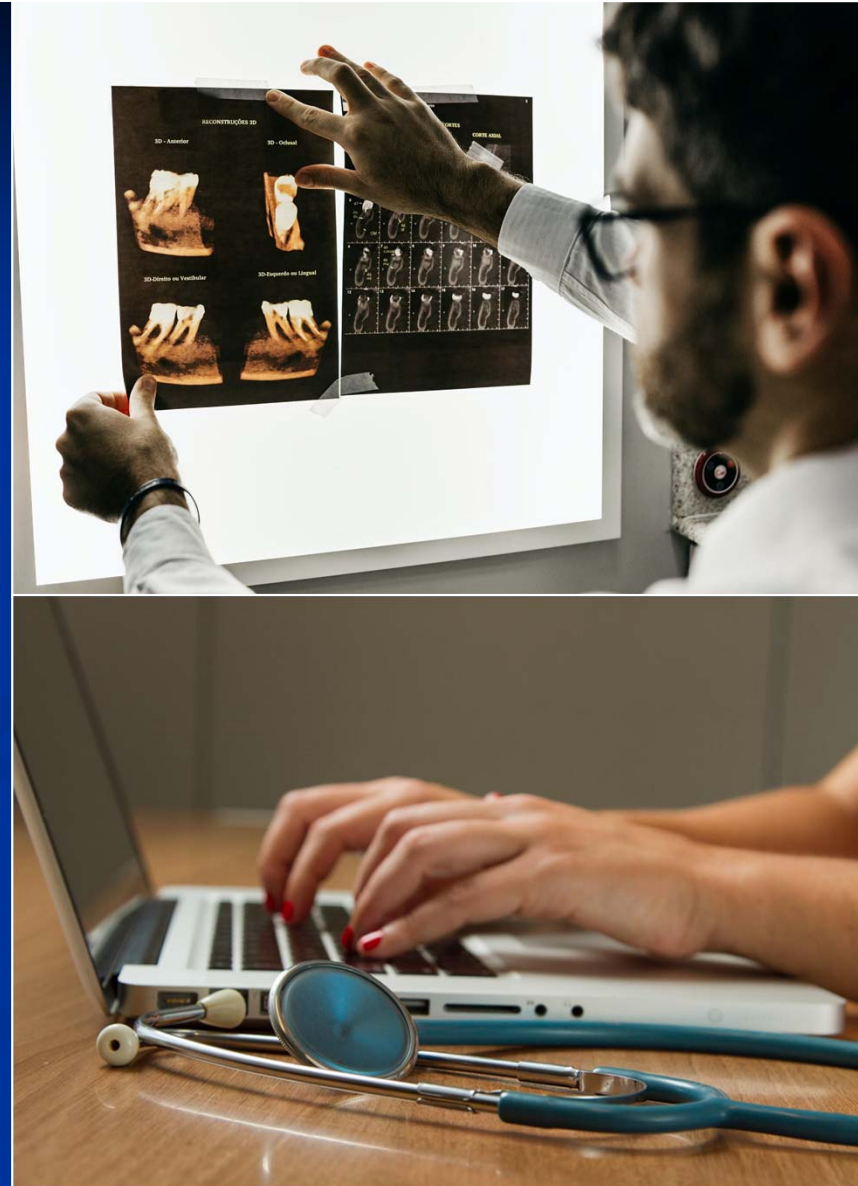
420 Groups I-1, R-1, R-2, R-3 and R-4

- Many changes throughout especially dealing with assisted living facilities and dormitories



422.6 Electrical systems in ambulatory care facilities

- Sends reader to Chap 27 and NFPA 99 regarding design and installation of these systems in ambulatory care facilities



424.1 Children's play structures

- Scope expanded to potentially include more structures
- "And" changed to "or" for conditional statements





427 Medical gas systems

- New section regulating such systems
- Provisions incorporated from IFC



428.3; 430; Table 430.3; Table 430.4(1) & (2); 907.2.2.2 Higher Education Laboratories

- Higher education lab provisions have been updated to be more in line with the 2018 IBC



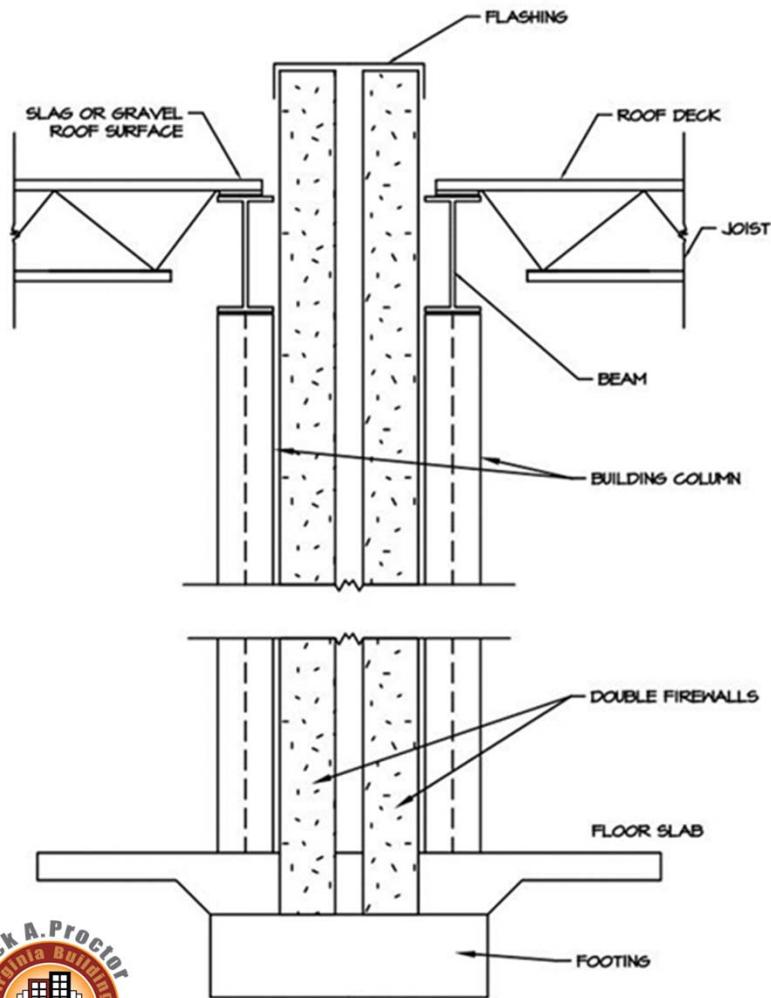
State Code Change

Q&A



Skill Check 1





503.1; 706.1 Scope of firewall use

- Clarifies that the 'separate building' concept driven by the firewall only applies to height, area and type of construction



503.1.4 Allowable height and area of occupied roofs

- New section clarifies how to deal with height, area and occupancy for occupied roofs



505.2.1.1 Mezzanine and equipment platform area limitations

- Where both are present, the 2/3 limitation generally cannot be exceeded

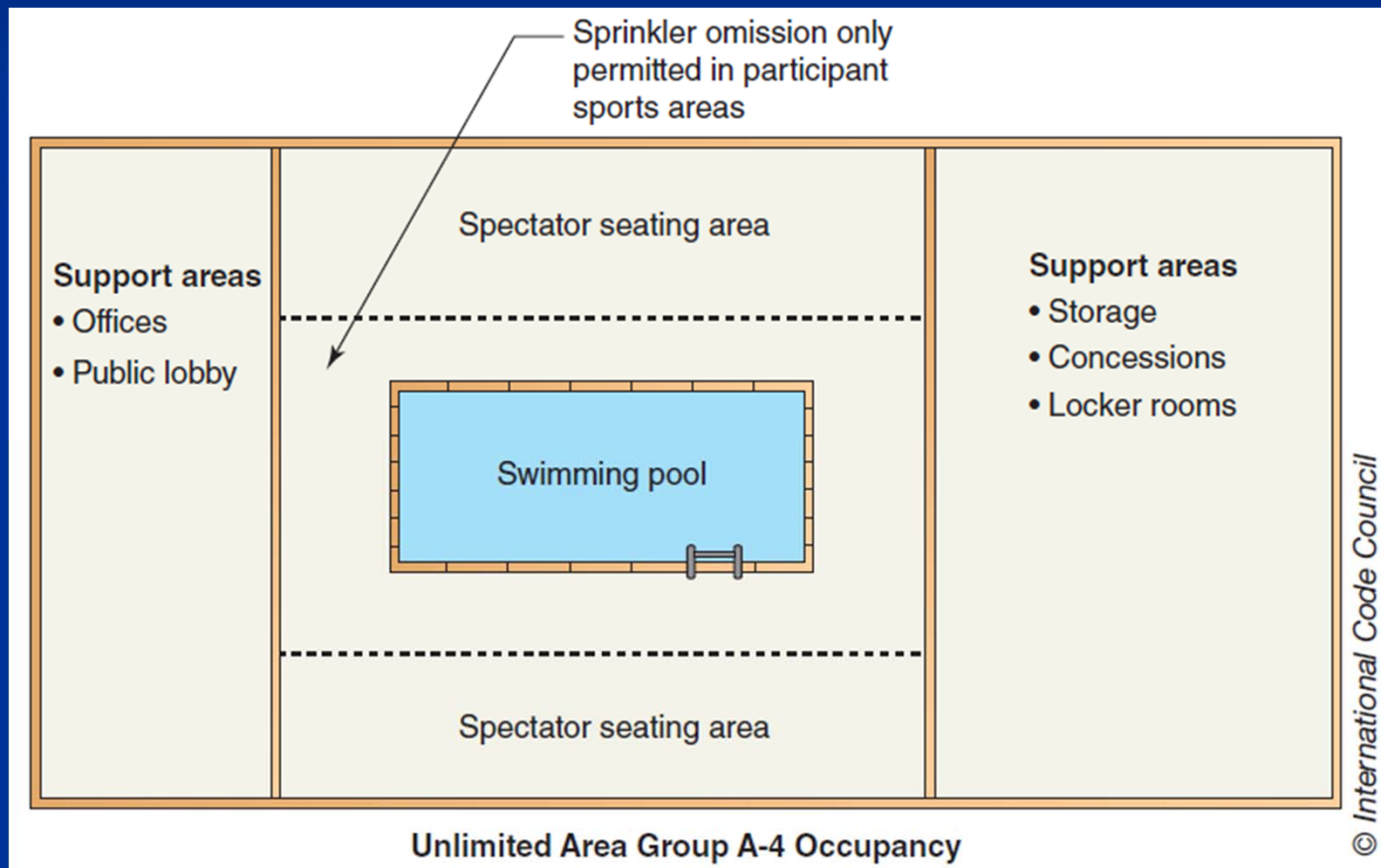


507.4 Sprinklers in Unlimited Area Group A-4 Buildings

- Sprinkler omission permitted for such indoor participant sports arenas is now clearly not applicable to storage rooms, press boxes, concession areas, and other ancillary spaces



507.4 Sprinklers in Unlimited Area Group A-4 Buildings



508.3.1.2 Group I-2, Condition 2 Nonseparated Occupancies

- Additional limitations included in mixed-occupancy buildings with nonseparated use, where one occupancy is I-2, condition 2 hospital use
- Increases fire protection and egress requirements within such occupancy



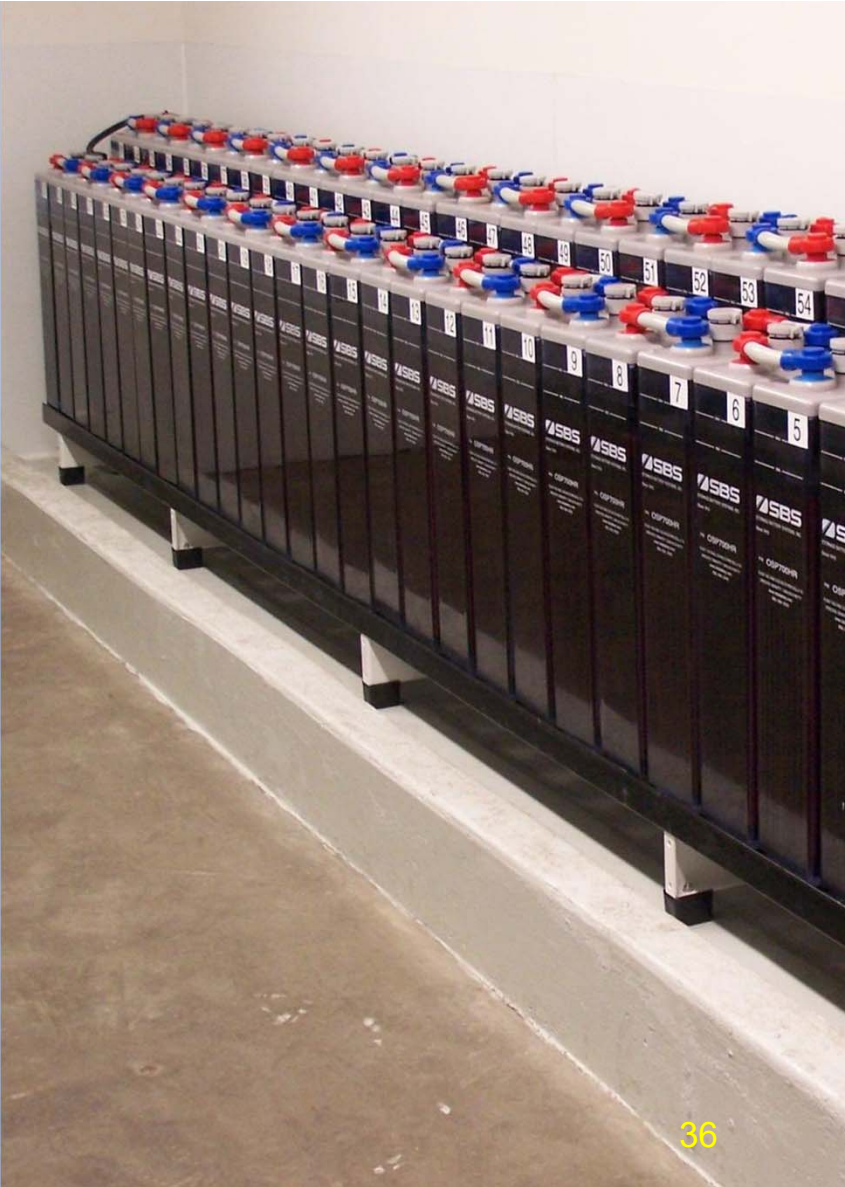
508.4.1 Separated occupancies vs. fire area separations

- Fire separations used for mixed-use occupancy and those used for fire area purposes are different concerns
- Most restrictive fire-rated conditions shall apply



Table 509 Incidental uses

- Updates requirements for incidental uses containing energy storage systems
- Change eliminated liquid electrolyte capacity of batteries and now refers only to energy capacity

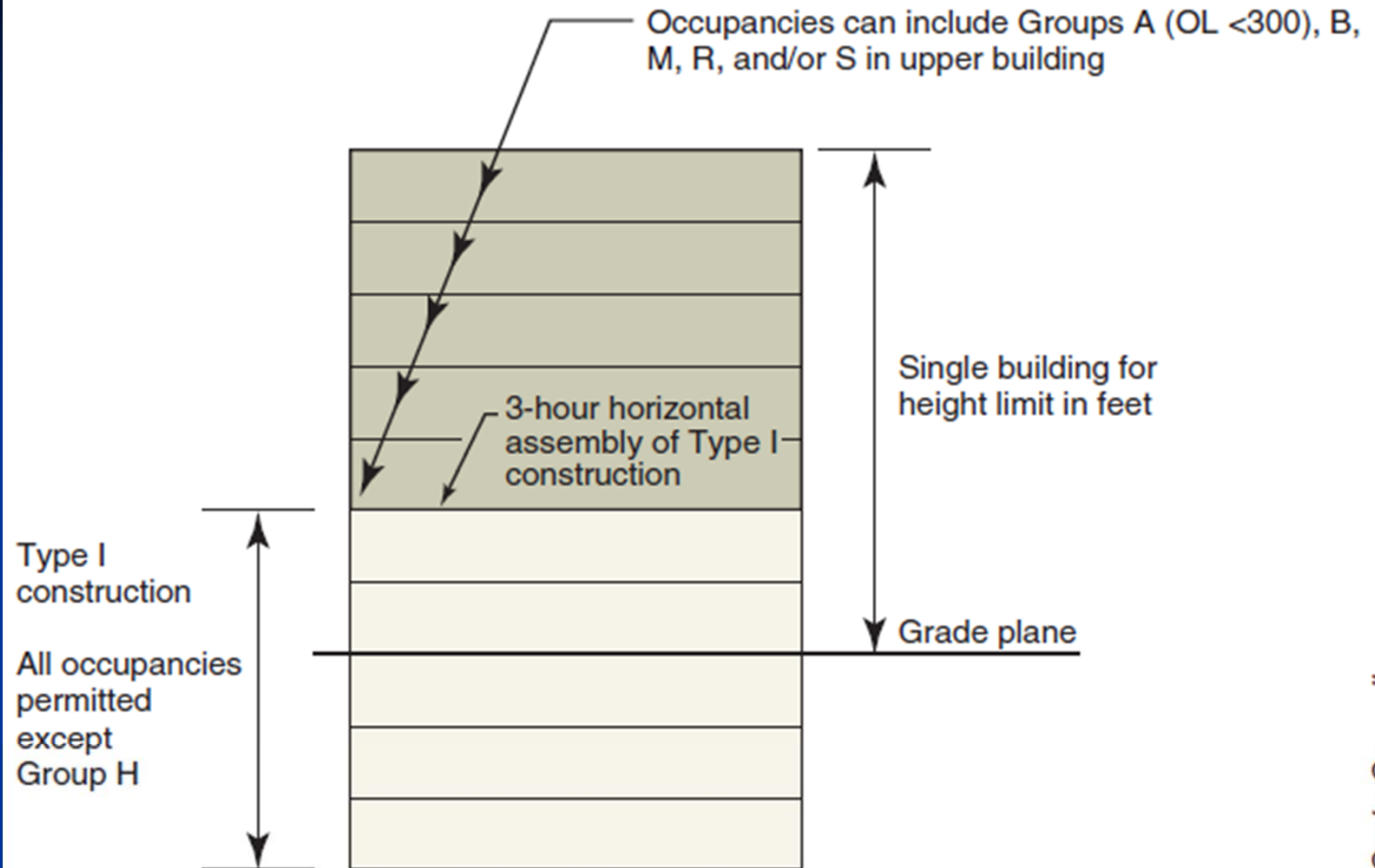


510.2 Horizontal Building Separation

- Vertical offsets are now permitted in horizontal fire-resistance-rated separation for podium buildings
- Min. required fire-resistance rating shall be maintained for offsets and supporting elements



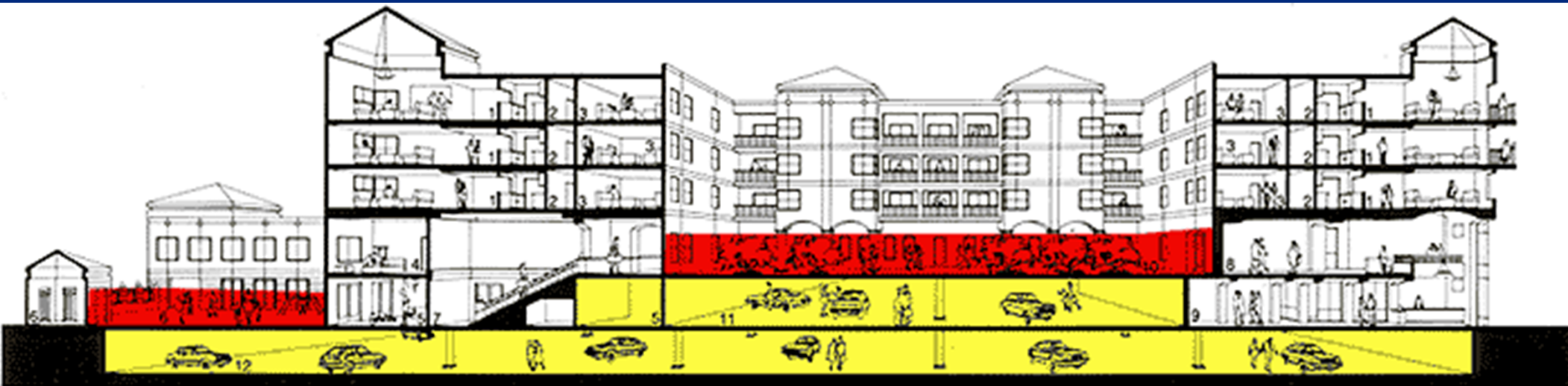
510.2 Horizontal Building Separation



Portions above and below 3-hour horizontal assembly to be considered separate buildings for:

- Allowable area
- Number of stories
- Fire wall continuity

510.2 Horizontal Building Separation



1. Apartment
2. Hallway
3. Lounge

4. Hostel
5. Childcare Center
6. Childcare Play Yard
7. Fitness Center Entry

8. Offices, Programs,
and Counseling
9. Career Center
10. Plaza

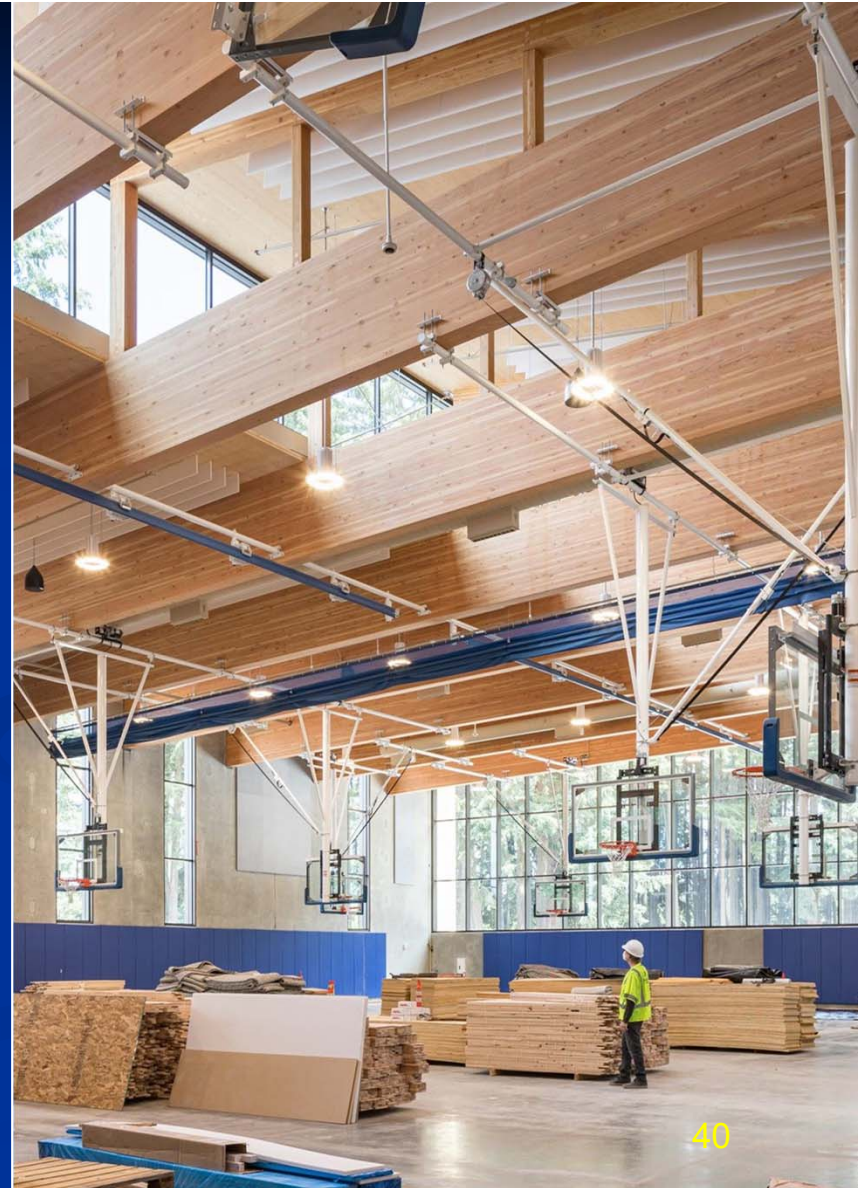
11. Street Level Garage
12. Lower Level Garage

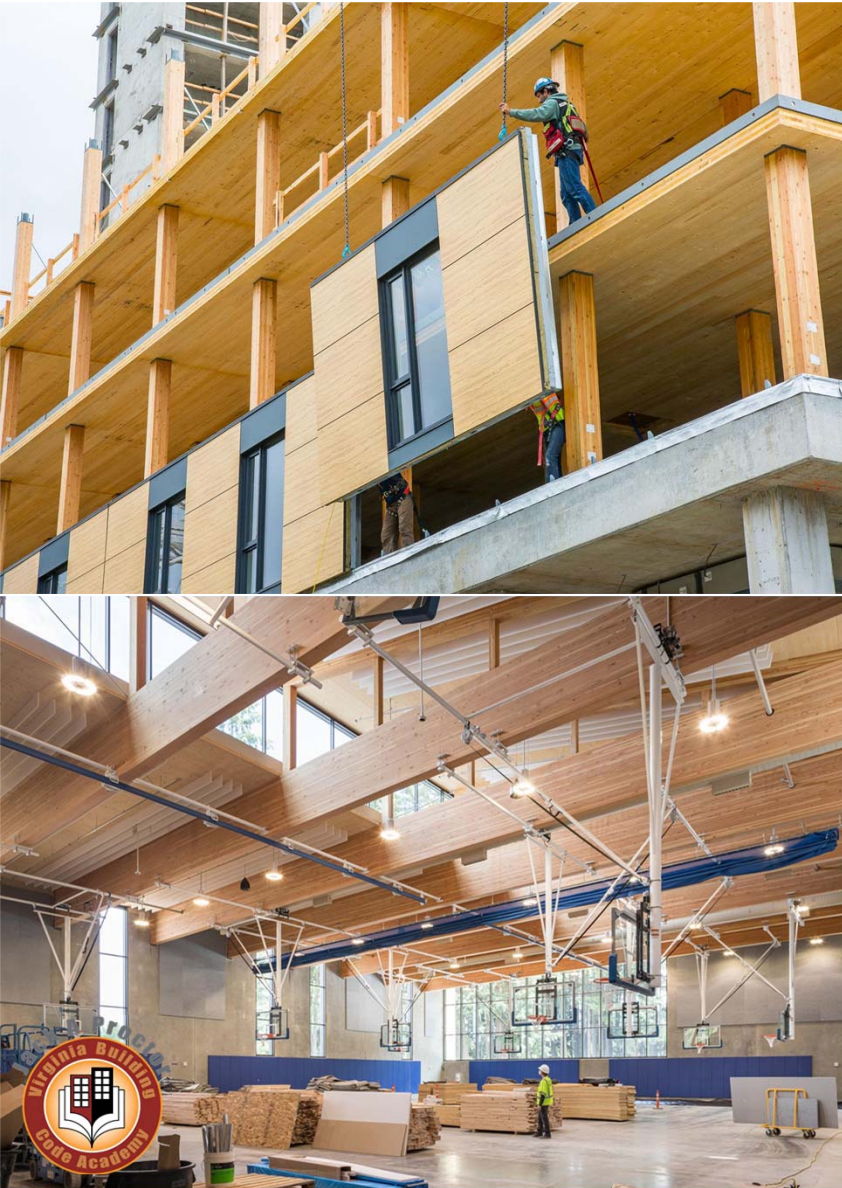
Elevation



Table 601, Note B Fire protection of structural roof members

- Portions of roof now selectively exempted from Table 601 fire resistance requirements where all of roof construction > 20 ft above floor





602.1.2 (new) Alternative provisions

- Provides alternative provision for tall wood provisions from 2021 IBC section 602.1.2
- Note that this section references the 2021 IFC provisions for mass timber as well
- Special section included in 2018 VCC



704.2 & 704.4.1 Column protection in light-frame construction

- A column in light framed construction that is part of the wall assembly and requiring fire protection is not required to be provided with individual encasement
- Fire rated assembly provides the required protection
- Note light framed construction is a defined term

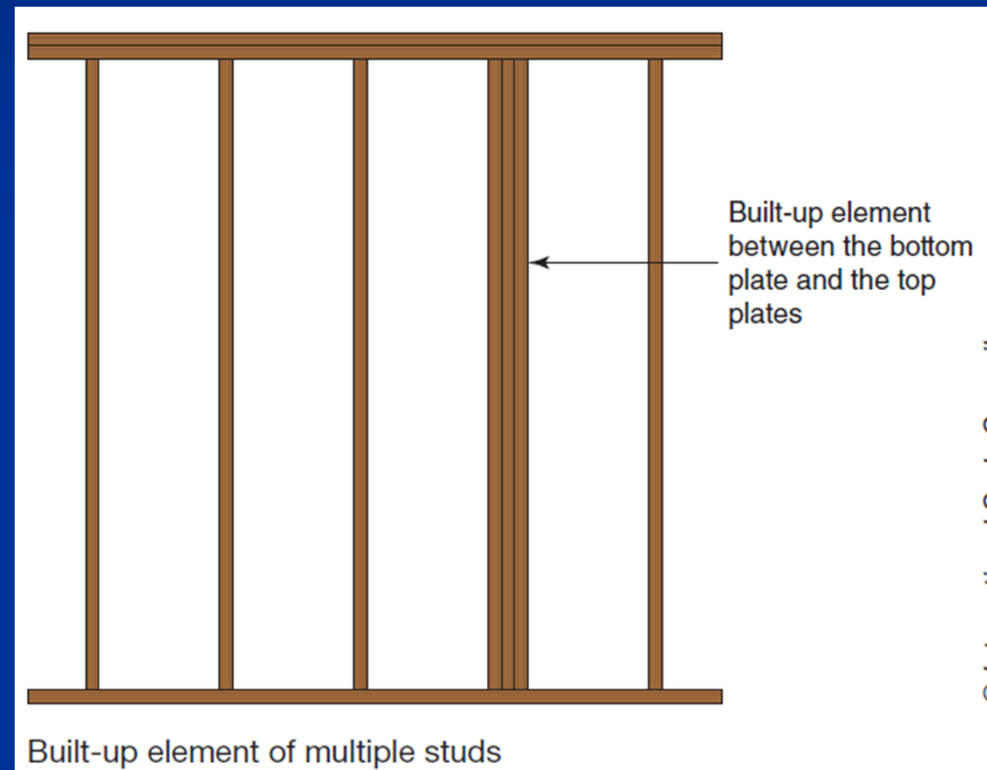
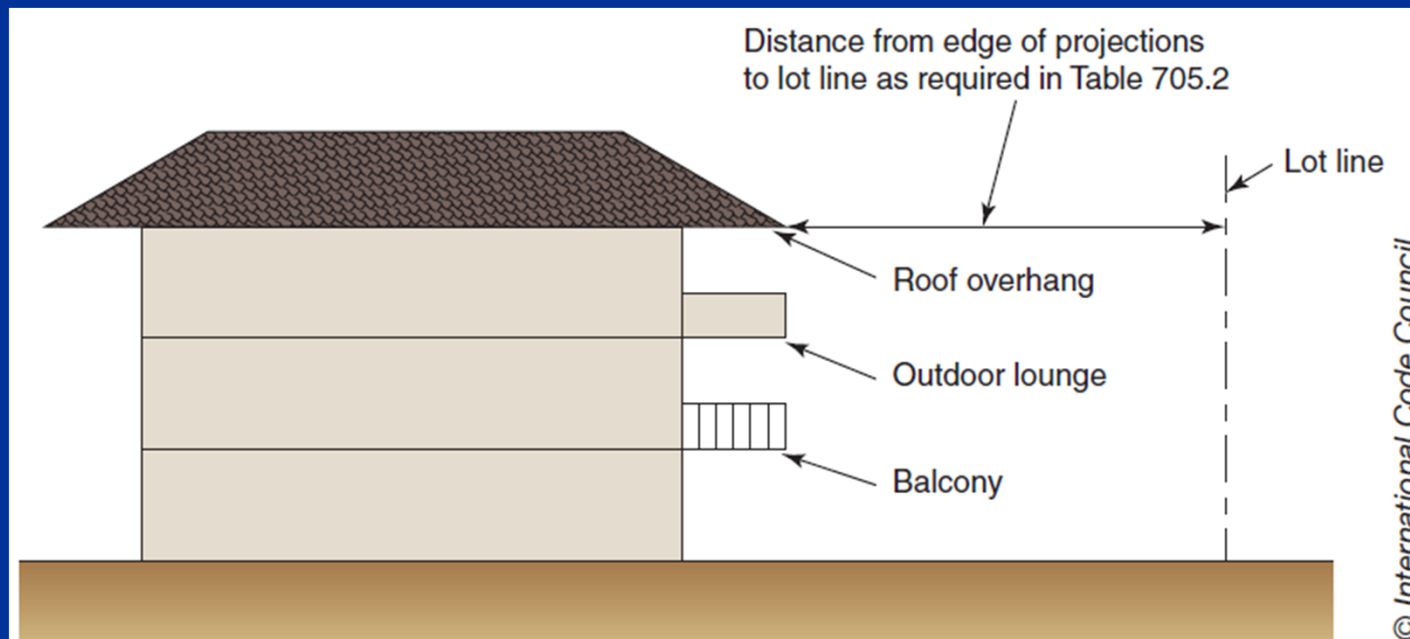


Table 705.2 Extent of projections

- Table values reduced
- Fixed a mistake in 2015 edition



Fire separation distance at projections

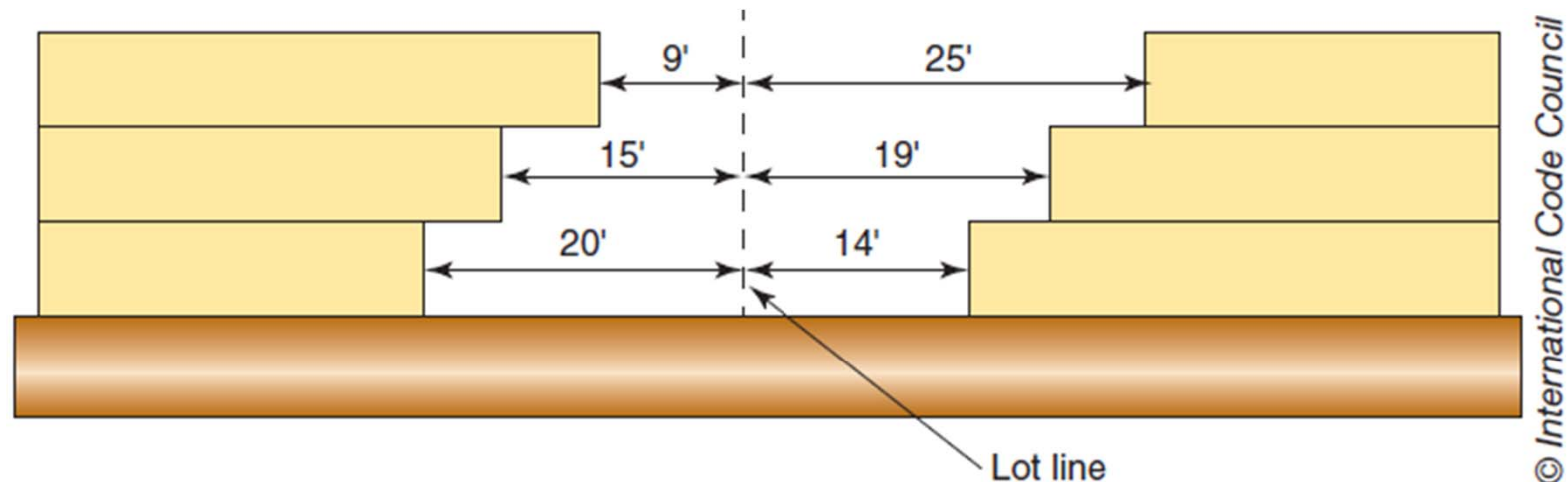
705.2.3 & 705.2.3.1 Combustible balconies, projections, and bay windows

- These requirements have been relocated from Chapter 14



705.8.1 Measurement of fire separation distance for opening protection

- The allowable area of openings in fire-resistance-rated exterior walls is to be based on the fire separation distance for each story, determined individually, in the same manner as applied in the determination of the required wall rating

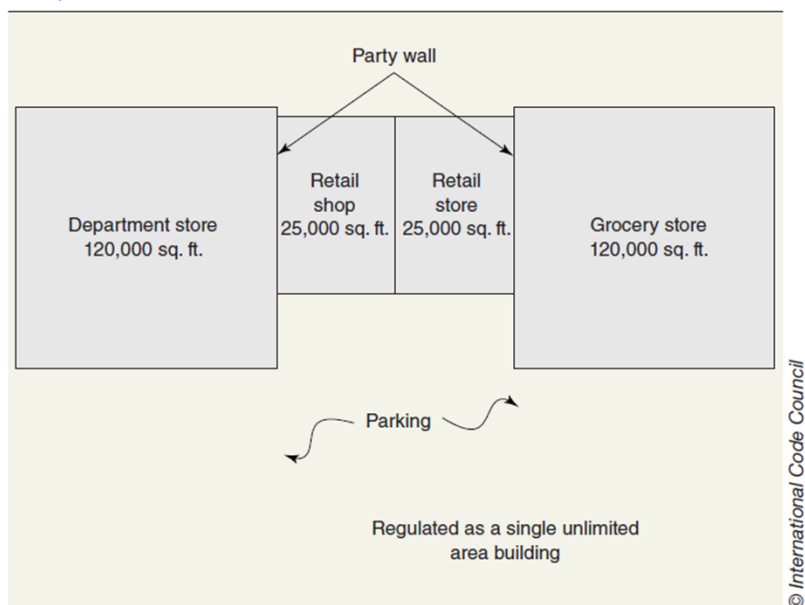


Exterior opening protection example

706.1.1 Party walls not constructed as firewalls

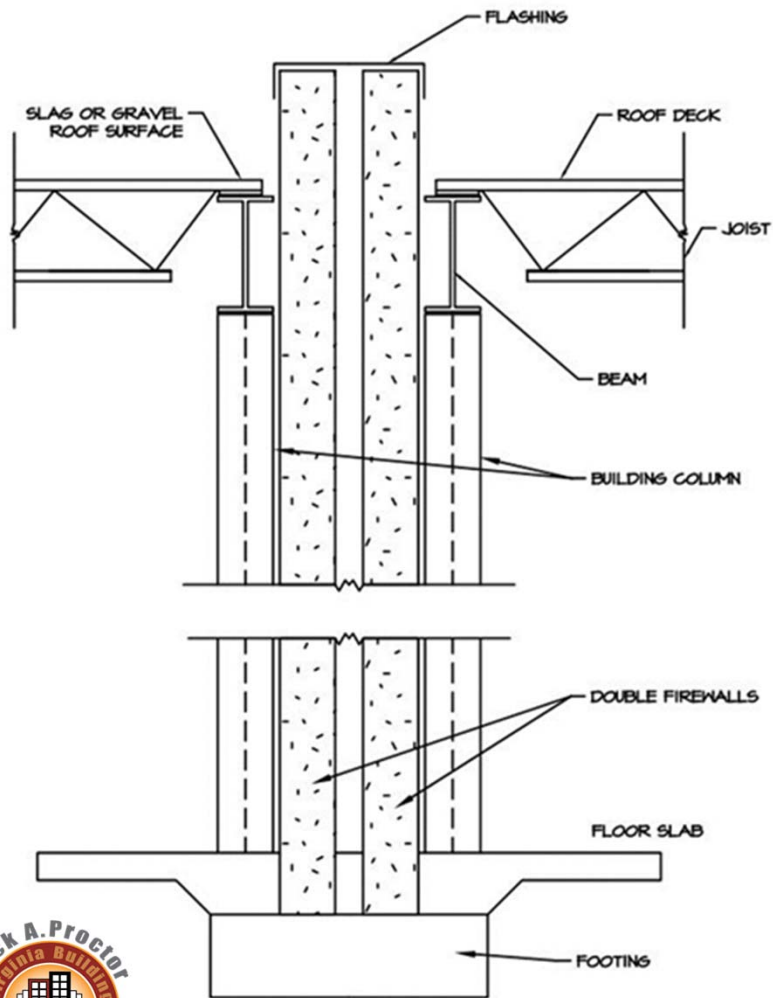
- New exception #2
- Construction as a firewall for a party wall is no longer required if entire building is compliant with Chapter 5, and applicable easements and agreements are established re: maintenance of fire and life safety in entire building

Example:



Use of party walls

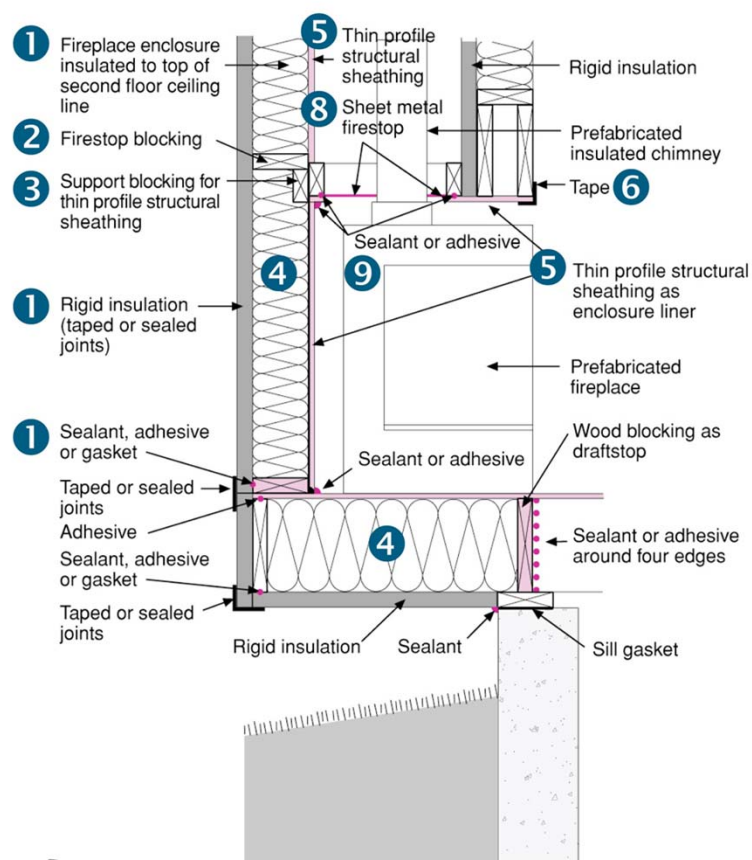




708.4 Continuity of fire partitions

- Section reformatted for clarity; see 708.4 for details

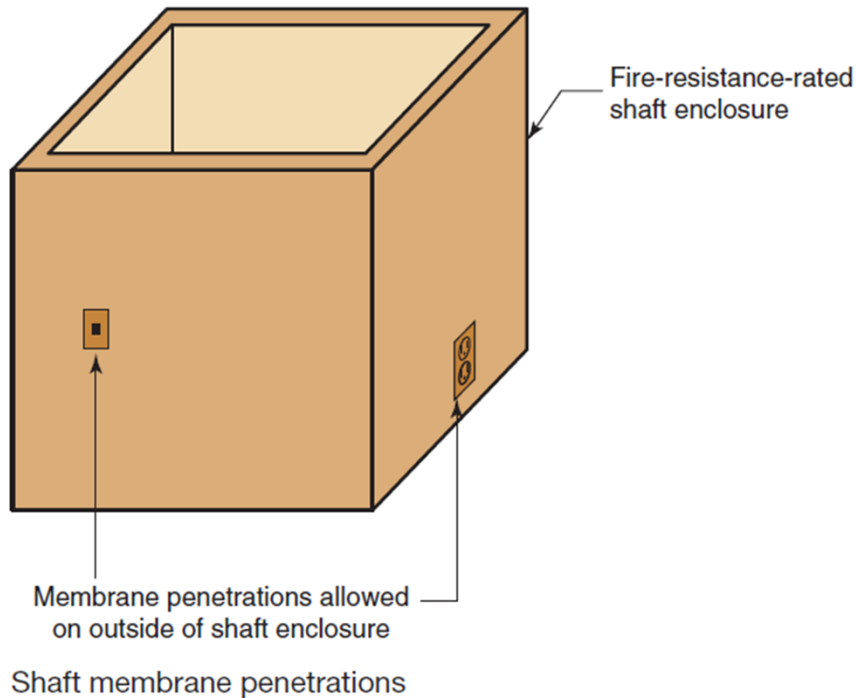
708.4.2 Fire blocking and draftstopping at fire partitions



- New section consolidates requirements for fire blocking and draftstopping applicable to fire partitions. Some exceptions modified
- Exception 3 removes such requirements from R-2 with 3 units or less
- Exception 4 limits height to 60 ft in coordination with NFPA 13R
- New exception 5 requires fire blocking and draftstopping for floor/ceiling assemblies in Group R-3 with 3+ units

713.8.1 Membrane penetrations of shaft enclosures

- Membrane penetrations not related to shaft may now penetrate outside of shaft
- Examples may include an outlet or receptacle




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716.2.6.5 Delayed-action self-closing doors

- Self-closing doors that are not also required to be automatic closing are now permitted to be equipped with delayed-action closers
- Definition of delayed-action closer added to Chapter 2

A close-up photograph of bright orange and yellow flames against a dark background, occupying the left half of the slide.

803.1.1; 803.1.2 Interior and ceiling finish testing

- Section reformatted for clarity
- Materials that pass NFPA 286 now considered to comply with Class A



803.11; 803.12 Flame spread testing of laminates and veneers

- Adds new requirements for factory-produced laminated products with wood substrate, and facings and wood veneers applied over wood substrate on site

Q&A



Skill Check 2





901.6.2 Integrated fire protection system testing

- Integrated fire protection and/or life safety systems must be tested as a whole per NFPA 4



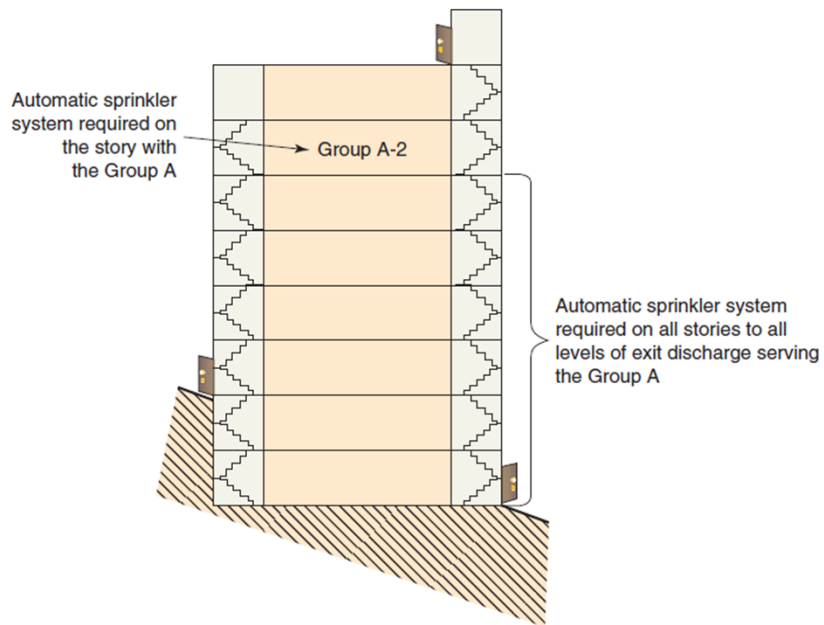


902 Fire pump and sprinkler riser rooms

- Prescriptive requirements added for design and construction of automatic sprinkler system riser rooms and fire pump rooms

903.2.1 Sprinklers required in Group A occupancies

- Corrects inconsistency regarding extent of sprinkler requirements for Group A occupancies



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Extent of Group A sprinkler protection



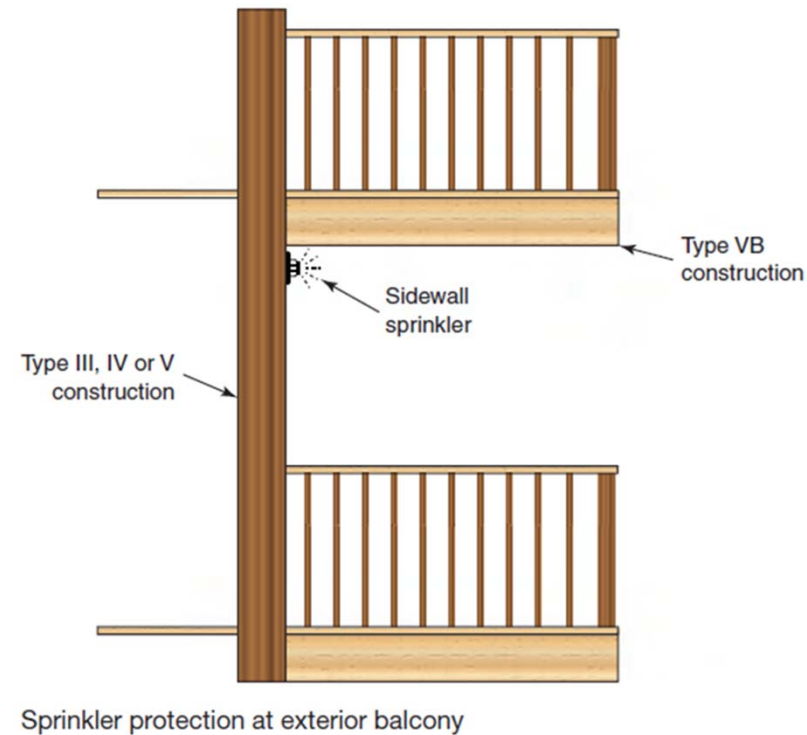
903.2.3 Sprinklers in Group E Occupancies

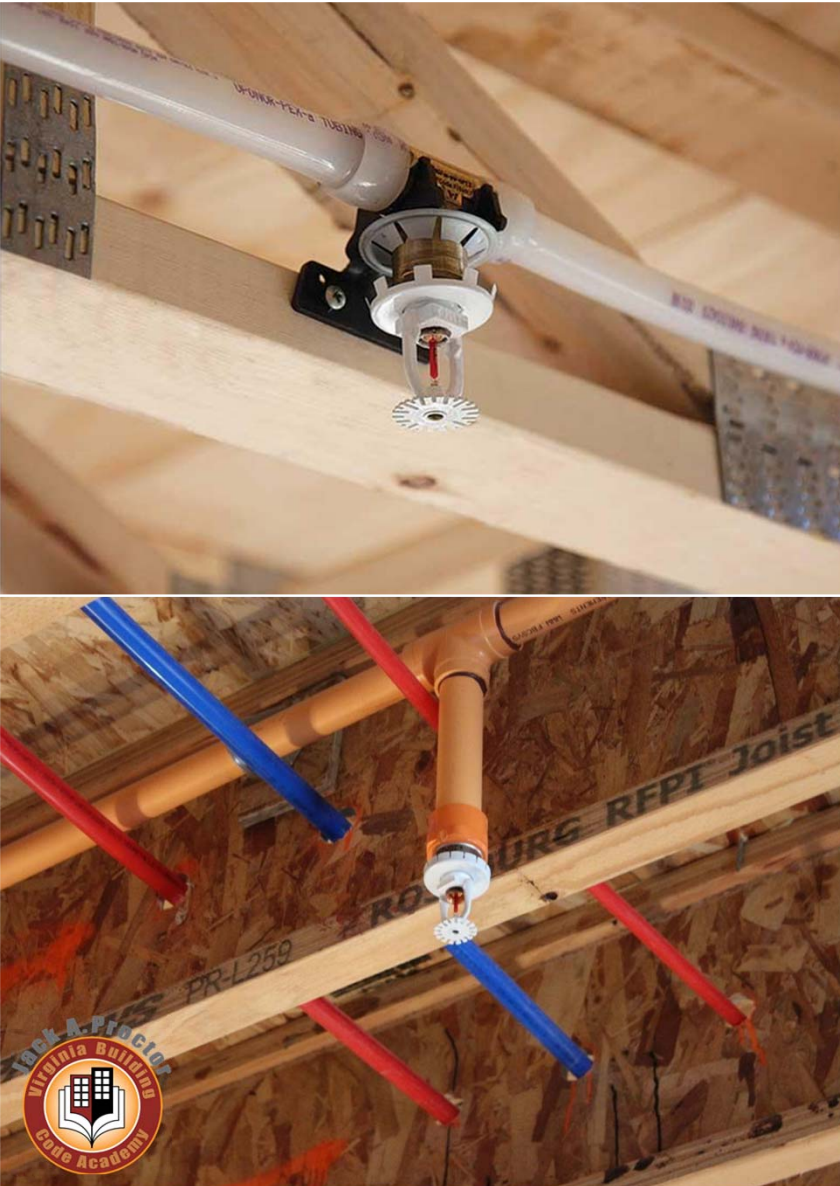
- Criteria for occupant load threshold, location within building added as conditions that could require sprinkler protection in such occupancies
- Note VA amends area threshold in Item 1 to 20,000 sqft or greater



903.3.1.2.1 Sprinkler protection at balconies and decks

- New exception added to coordinate with existing requirements in 705.2.3.1 exception 3





903.3.1.2.3 Protection of attics in Group R occupancies

- Sprinkler protection or acceptable alternative attic protection are now addressed for mid-rise buildings housing multi-family occupancy and equipped with an NFPA 13R system
- 2015 VCC 903.3.1.2.2 "Attics" is relocated to 2018 VCC 903.3.1.2.3.1 and renamed "Group R-2 attics"



904.12 Commercial cooking operations

- Commercial cooking systems now permitted to be protected with water mist fire-extinguishing system complying with NFPA 750
- NFPA 96 added from mechanical code for reference

904.13 Domestic cooking protection in institutional and residential occupancies

- Automatic fire-extinguishing systems now required over cooktops and ranges in I-1 and R-2 college dormitories
- Requirements for I-2, Condition 1 are reformatted but unchanged



905.3.1 Required Class III standpipes

- Class III Standpipes required on buildings four or more stories above or below grade plane



State Code Change

905.4 Class I Standpipe connection locations

Modifications made to:

- Location of hose connections within interior exit stairway enclosures, and
- to the # of connections required where open breezeways and open stairs provided



907.2.1 Fire alarms in Group A occupancies

- FA system required where a Group A occupant load >100 is located above or below level of exit discharge





907.2.10 Group R-4 fire alarm systems

- Manual FA systems and automatic smoke detection systems no longer required in R-4



918.1 In-building emergency communications

- Exception added for localities that do not provide the additional communication equipment required



State Code Change

1004.8; Table 1004.5 Occupant load calculation in business use areas

- Occupant load calculation for business areas revised.
- Higher loads can be assigned to concentrated business areas per 1004.8

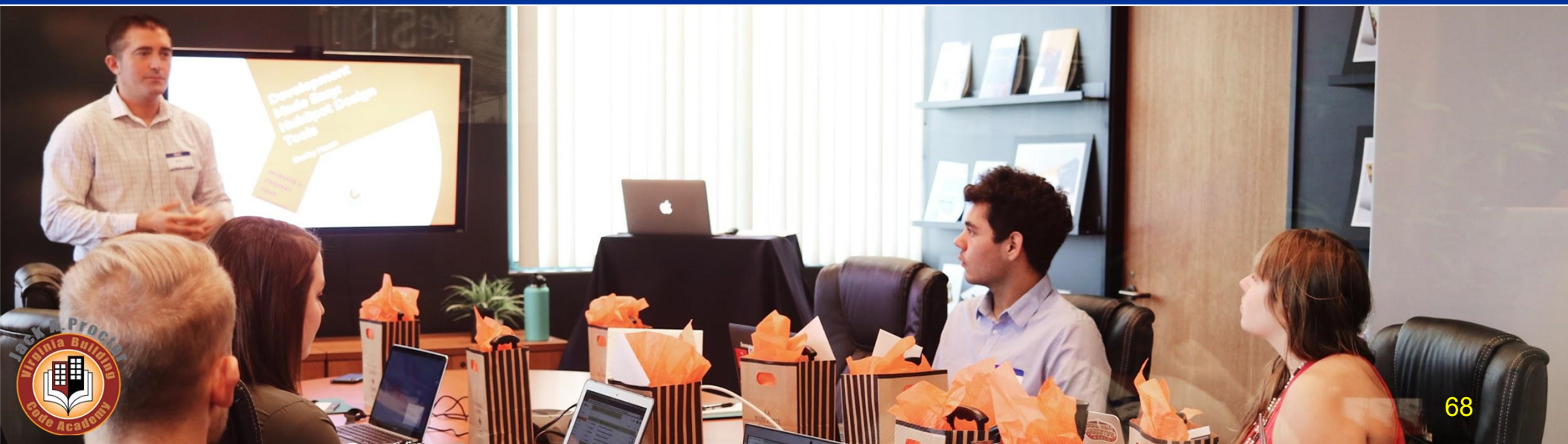
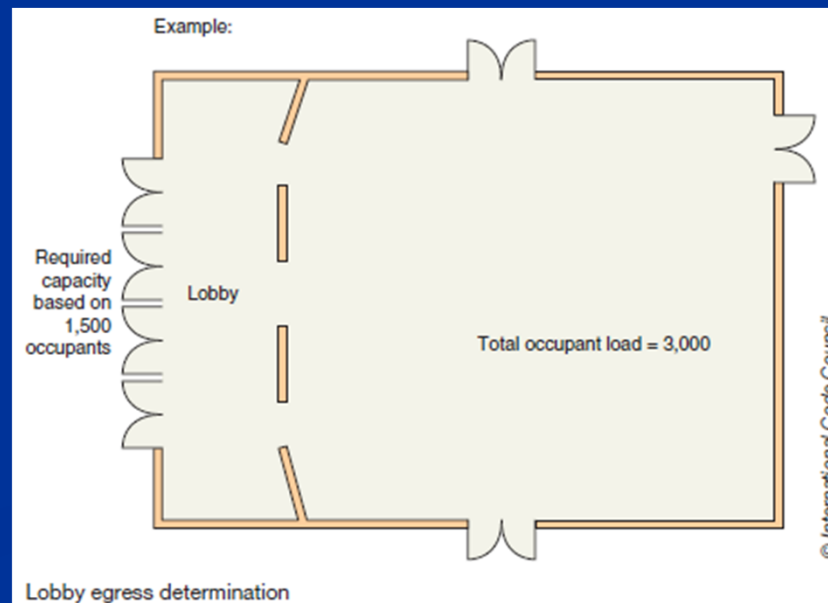


Table 1006.2.1; 1006.2.1 Group R spaces with one exit or exit access doorway

- Section reformatted
- Approach to accumulating occupant loads from adjacent rooms discharging through foyers through lobbies has been clarified
- Table changed





1006.3; 1006.3.1 Egress through adjacent stories

- Section clarified where occupants must travel to adjacent story to reach complying exit(s)

1008.2.3 Illumination of the exit discharge

- Clarifies exit discharge lighting is required from the exit to the public way



1009.7.2 Protection of exterior areas of assisted rescue

- Like interior areas of refuge, passive protection is not required separating exterior areas of rescue where the building is equipped with an automatic sprinkler system



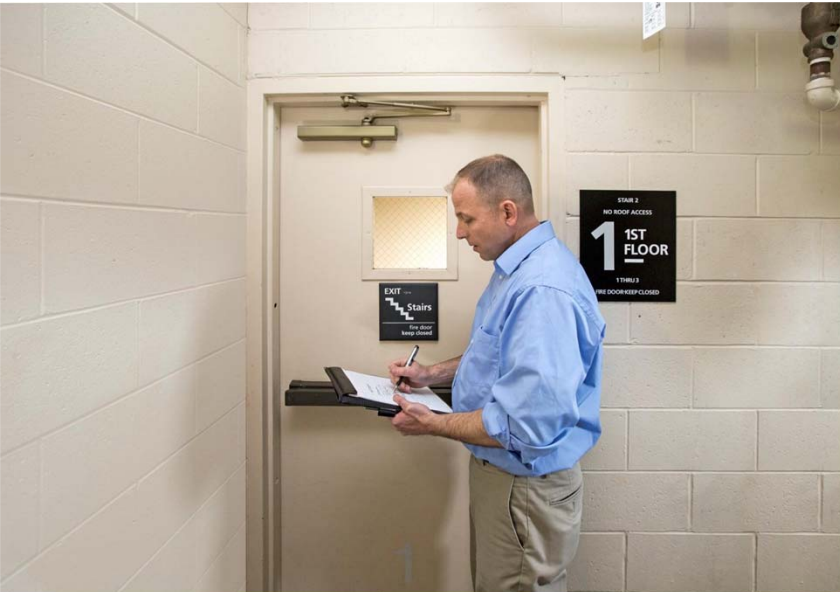


108.1; 110.1; 1010.1.4.4; 1010.1.9.1; 1103.2.15 Emergency supplemental hardware

- New Emergency Supplemental Hardware definition
- Allows, by exception, the use of locking devices on exit access doors in Group E occupancies
- Requires a building permit for the installation of such locking devices.
- Requires BO to consult with Fire Code Official or State Fire Marshal and local law enforcement head prior to approval of said devices
- Emergency Supplemental Hardware exempt from some Ch. 11 requirements

1010.1.9.12 Locks on stairway doors

- Section now applies to all multi-story conditions which are not considered high-rise buildings



1010.1.10 Electrically locking of panic or fire exit hardware

- Doors provided with panic hardware or fire exit hardware and serving a Group A or E occupancy are permitted to be electrically locked



1010.3.2 Security Access Turnstiles

- New conditions of use are now provided to BO with criteria to evaluate such turnstiles located in a manner to obstruct means of egress





1017.3; 202 Measurement of egress travel

- Common path of egress travel limitations must be applied to each room or space on every story
- New definition for 'common path of egress travel' added to Chapter 2



1023.3.1 Stairway extensions

- Fire-resistance-rated separation not required between interior exit stairway and exit passageway where both are pressurized

1026.2 Openings in horizontal assemblies

- Openings in horizontal assemblies on the story served by horizontal exit are required to be protected in accordance with Section 712.1.1, 712.1.3, 712.1.13, or 1019.3 item 4

State Code Change



1030.1 Required Emergency Escape and Rescue Opening

- Clarifies occupancies where EEROs are required
- Min. # of required openings in residential basement is revised



Q&A



Skill Check 3



1103.2.8 Raised and lowered areas in places of religious worship

- Exempts areas, or portion of areas, used "primarily" for the performance of religious ceremonies from the accessibility requirements

1109.2.4; 1209.3; [P]2902.1 Gender Neutral Toilet Facilities

- Guidance added regarding such facilities
- Includes accessibility, urinal substitutions, equivalency issues when basing ratios on 100% of occupants
- Correlated changes in plumbing code - see plumbing section for full details



State Code Change



1109.2.1.2 Fixtures in family or assisted-use toilet rooms

- May now include child-height toilet and sink in family or assisted-use toilet rooms



1110.4.13 Access to play areas for children

- Play areas containing play components designed for children shall be located on the accessible route
- Applies only to play areas that are within the scope of the USBC



1206.2; 1206.3 Engineering analysis of sound transmission

- Sound transmission performance for residential buildings can be based on engineer's analysis, based upon comparison to previously tested assemblies



1404.18 Polypropylene siding

- Polypropylene siding is now specifically permitted for use on exterior walls of any type of construction when other provisions of the IBC allow its use



1507.1.1 Underlayment

- The provisions for underlayment and ice barriers have been relocated and consolidated at the beginning of 1507
- Note 3 new related tables

1507.18 Building-integrated photovoltaic panels

- New section of provisions for photovoltaic panels used as roof covering; deck, slope, underlayment + application, ice barrier, materials, attachments including high wind



1604.3.7 Deflection of glass framing

- Note new section adds deflection limits for framing that supports glazing



Table 1607.1 Live load

- Live load calculation for decks and balconies has been changed to 1.5 times the load of the area served, up to 100

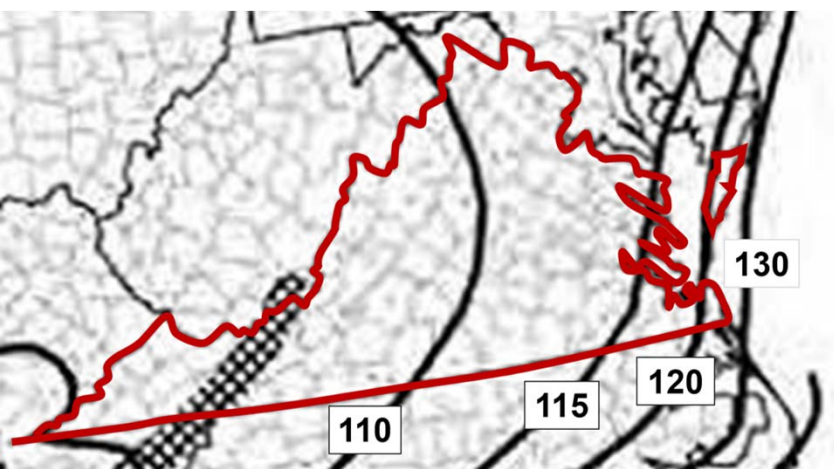


1607.15.2 Minimum live load for fire walls

- Firewalls are required to resist 5 psf lateral load

1609 Wind loads

- 1609 now includes new wind speed maps





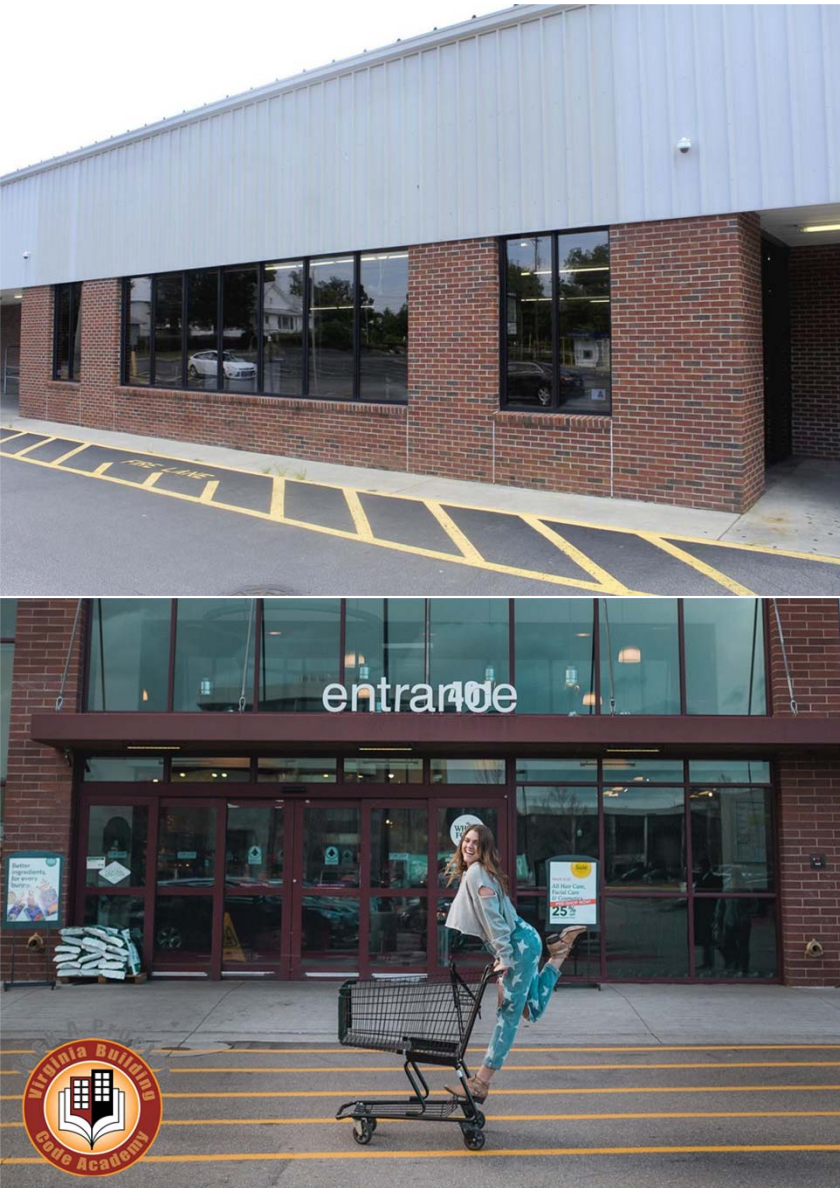
1613; 1613.2.1 Earthquake loads; seismic maps

- The earthquake coefficients have been updated to coordinate with ASCE 7 - 2016



1704.6 Structural observations

- New section 1704.6.1 requires structural observations of high-rise buildings or risk category IV
- Shall be conducted by RDP who designed the building
- New requirement in addition to special inspections



1804.4 Site grading

- Impervious surfaces excepted from min 2% grading requirement near doors to meet requirements of Chapter 10



2207.1 SJI standard

New standards for steel joists:

- SJI 100-15
- SJI 200-15



2211 Cold-formed steel light-frame construction

New standards for cold formed steel:

- AISI S240-15
- AISI S400-15
- AISI S202-15



2303.2.2 Fire-retardant-treated wood

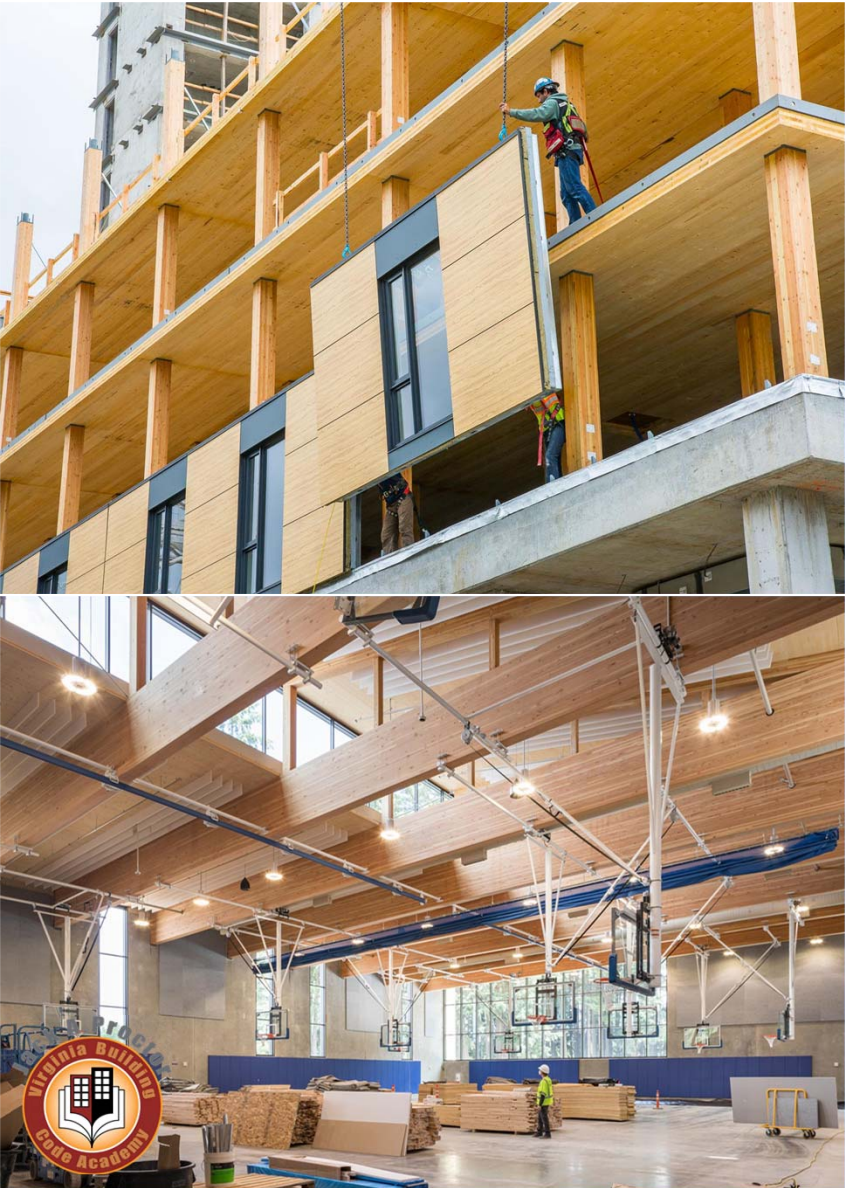
- Allowable types of fire-retardant-treatment for lumber have been clarified
- Use of paints, coatings, stains or other surface treatments is not approved means of complying with this section





2304.10.5; 2304.10.5.1; 2304.10.5.3 Fasteners in treated wood

- Staples must be stainless steel in preservative-treated wood and fire-retardant-treated wood



2304.11 Heavy timber construction

- Heavy timber provisions of Chap 23 have been reorganized
- Table on engineered lumber dimensional equivalencies relocated here

2304.12.2.5; 2304.12.2.6 Supporting members for permeable floors and roofs

- Moisture barrier system protecting the structure must provide positive drainage
- Ventilation required beneath balcony or elevated walking surface providing net free cross-ventilation area of at least $1/150$ of area of each space

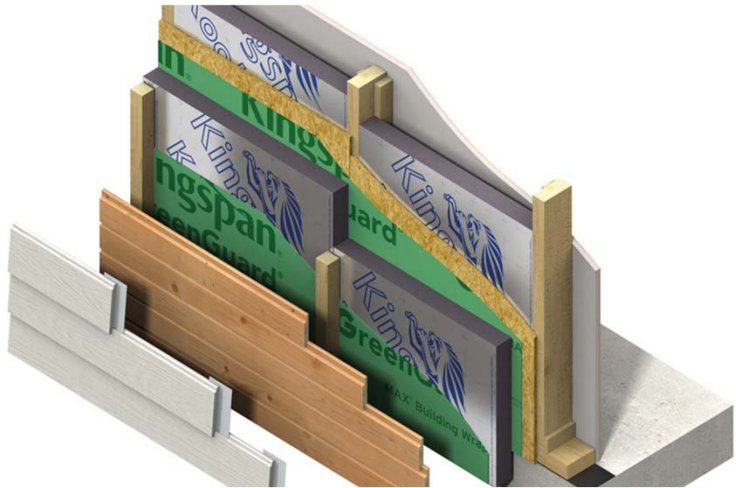




2407.1 Structural glass baluster panels

- Requirements for glass panels that are used as a structural component in a guard have been clarified
- Structural glass baluster panels now require a handrail or rail top

2603.13 Cladding attachment over foam sheathing to wood framing



- New requirements for cladding over foam sheathing and wood framing have been added.
- Consistent with IRC and cold-formed steel stud requirements. Refer back to 2603.13.1 for attachments
- Furred cladding attachments reference Table 2603.12.1, and .2, and back to 2303.1.9 and 2304.10.5



3001.2 Emergency elevator communication systems

- Elevators now require 2-way communication systems for deaf, hard of hearing, and speech impaired
- Must be live text and video based 24/7 interactive system

3002.4, 3005.4 Elevator machine rooms

- Star of life symbol now required on each floor level.
- Exception added for elevator machine rooms in buildings with > four stories above grade plane



State Code Change



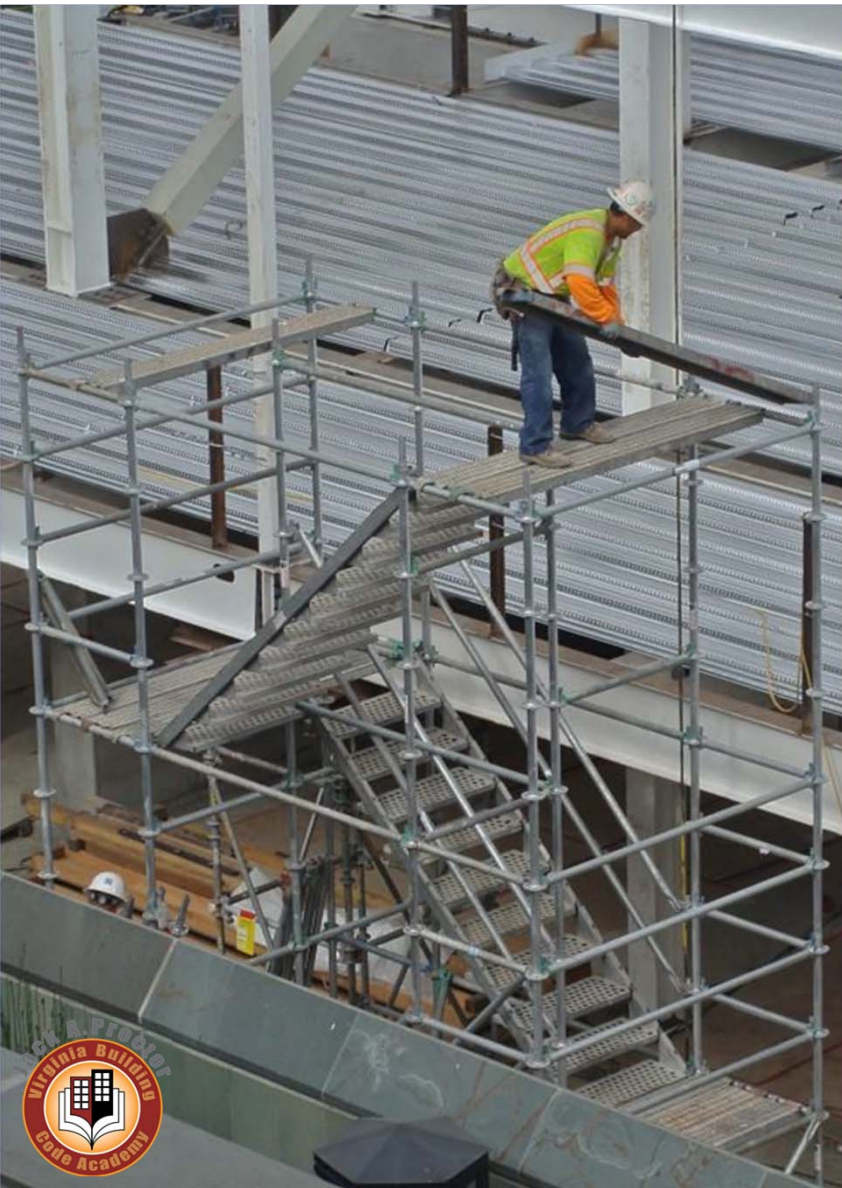
3007.1 Extent of fire service access elevator travel

- Fire Service Access Elevators need only serve the floor of fire department access and above, but not below
- A new exception exempts elevators serving only open or enclosed parking garages and a building lobby from FSAE requirements



3008.1.1 Required number of occupant evacuation elevators

- The required number of occupant evacuation elevators is now based on a calculation.



3310.1 Stairways in buildings under construction

- At least 1 stairway must be provided in buildings under construction once that building reaches 40 ft above lowest level of FD access

Questions?



Skill Check 4



Credits

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 Old by Vlad Sargu from unsplash.com
 Dorm by Matt Reame from unsplash.com
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 Medical gas piping system by Unknown from ny-engineers.com
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