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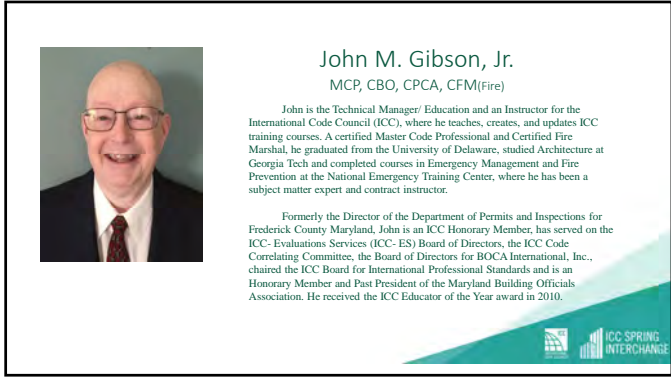
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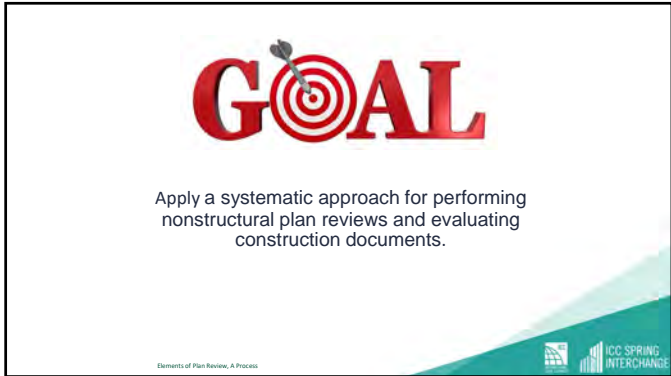
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**AGENDA**

- Preparation
- Risks
- Code approach to risks
- Code analysis submittals
- Review process
- Tier concepts
- Summary



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**Overview**



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**Permit Applications**

- An application for a permit requires that information on the work to be performed is transmitted to the appropriate building department.
- The proposed scope of work must be adequately detailed to describe the extent of work being performed and is required to be accompanied with **construction documents**.

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### Construction Documents

- Construction documents are written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.
- Drawings are graphic representations of the proposed work and serve to illustrate the physical relationship of materials to each other, including sizes, shapes, quantity, locations and connection.
- The plan reviewer must know how to read plans and determine compliance with the applicable adopted codes.



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### Plan Review

- The building department reviews plans for compliance with the code and other applicable laws of the jurisdiction
- If plans are found in compliance, a permit can be issued for the work
- If plans have discrepancies, a plan review report is provided to the applicant
- The applicant makes corrections to the plans and resubmits them to the building department for review
- Permit is issued when plans are "approved" and are issued to be used for the proposed construction.

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### Plan Review- Overview

- Plan reviewers must recognize the role that they serve in the process.
- Stakeholders in the process:
  - 1) Property owner
  - 2) Tenant
  - 3) Design team members (RDP, Product Manufacturers, Suppliers)
  - 4) Contractor, Builder, Subtrades
  - 5) Jurisdiction authorities (regulatory agencies- Federal, State, Local)
  - 6) Citizens of the jurisdiction
- Governmental department's role- representing the Citizens of the Jurisdiction.




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### Plan Reviewer Roles

- Ambassador
- Educator
- Facilitator
- Decision-maker

Remember the reviewer's "community responsibility" does not allow direct involvement in design! (Liability)



ICC SPRING INTERCHANGE

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## Preparations



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### Approach to Plan Review

- Reviewer's
  - Attitude
  - Behavior
  - Methods
  - Actions
- Profound effect on the outcome



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**ATTITUDE**

- “Our Attitude governs our thoughts...
  - Which controls our actions...
    - Which becomes our habits...
      - Which shapes our character...
        - Which therefore determines our destiny!”



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**Approach**

- Positive approach
- Respect, courtesy and diplomacy
- Raise bar of professionalism
- Improve image of reviewer
- Makes life easier all around



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**First Impressions**

- “7/11” rule First 7 seconds: taking 11 assessments
  - 1) Cleanliness 2) Attractiveness 3) Credible
  - 4) Knowledgeable 5) Responsive 6) Friendly
  - 7) Helpful 8) Empathetic 9) Courteous
  - 10)Confident 11)Professional
- a) Like    b) Don't like    c) Don't trust



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### Expectations of you

- Accurate information
- Answers to inquiries
- Follow-up when promised
- Timely reviews
- Courteous behavior



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No matter what job you have in life, your success will be determined 5% by your academic credentials, 15% by your professional experiences, and 80% by your communication skills.



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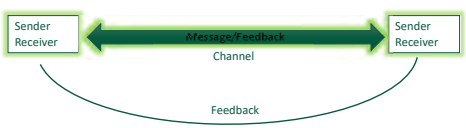
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### Communication Model



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### Receiving the Message (Face to face)

- Look at the person
- Pay attention to their body language
- Nod and smile to acknowledge points
- Allow the person to speak
- Don't interrupt



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### Reasons for not Listening

- Already made up mind
- Hearing only what you want to hear
- Jumping to conclusions
- Lack of interest
- Being angry, upset, or worried about other things



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### Why are People Difficult?

- People
  - Are rushed – not enough time
  - Feel insecure
  - Feel angry
  - Have some need or interest
  - Are stressed

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### Conversations with Difficult People

| DO                            | DON'T              |
|-------------------------------|--------------------|
| Defuse                        | Escalate           |
| Stay calm                     | Argue              |
| Listen                        | Interrupt          |
| Let them vent                 | Blame              |
| Speak quietly                 | Raise your voice   |
| Be objective                  | Criticize          |
| Remain confident and positive | Take it personally |

"QTIP"




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## Risks




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### Community Responsibility

- Each community has concerns regarding the built environment and the impact that it will make on the community.
- These impacts may present risks that are in common with other communities or unique issues for that community.
- What specific or unique community defined issues do you as a plan reviewer define as the most important ones?
- \_\_\_\_\_




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**Construction Documents-  
Scope of Submittals**

- What Information is needed ?:
- Risks associated with a structure:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_



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**Construction Documents-  
Scope of Submittals**

- Information needed:
- Broad risks associated with a structure:
  1. Risk from fire.
    - Creation, exposure, spread, property loss
  2. Risk associated with exiting
    - Timely egress, safety, accessibility
  3. Risk from structural failure
    - Loads- dead, live, environmental
  4. Risk from interior environment
    - Adequate spaces, ventilation, safe conditions



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**Code approach to risks**



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**Construction Documents-  
Scope of Submittals**

- Code Information needed:
  - Broad risks associated with a structure:
    - Where are they addressed in the codes?

- 1. Risk from fire.
- 2. Risk associated with exiting
- 3. Risk from structural failure
- 4. Risk from interior environment



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**Construction Documents-  
Scope of Submittals**

- Code Information needed:
  - Broad risks associated with a structure:
    - 1. Risk from fire.
      - Chapters 3, 4, 5, 6, 7, 8, 9
    - 2. Risk associated with exiting
      - Chapters 10, 11, 4
    - 3. Risk from structural failure
      - Chapters 6, 7, 16, 17, 18 (materials- 19, 21, 22, 23)
    - 4. Risk from interior environment
      - Chapter 12



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**Construction Documents-  
Scope of Submittals**

- Code Information needed:
  - Broad risks associated with a structure:
    - Where is they addressed in the submittal?

- 1. Risk from fire.
- 2. Risk associated with exiting
- 3. Risk from structural failure
- 4. Risk from interior environment



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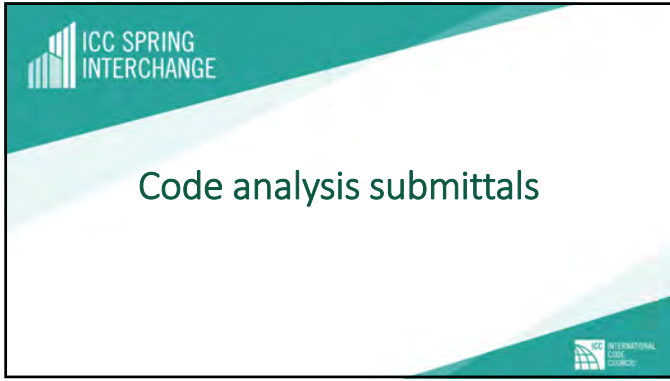
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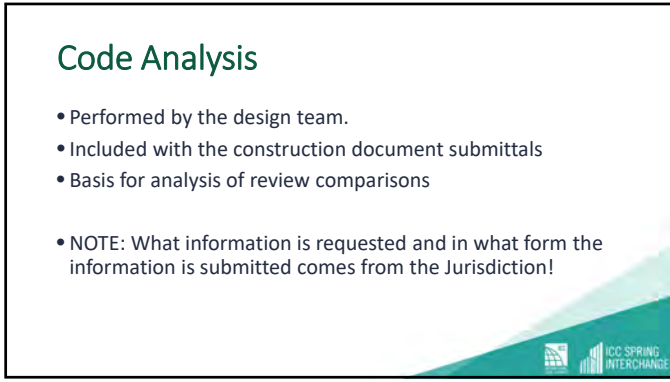
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### Concept for a Plan Review

- A quality plan review includes two important functions:
  - The ability to accurately and quickly understand the various types of information provided on the construction documents, and
  - The efficient and comprehensive review of the documents for compliance with the applicable codes, standards and ordinances.



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### Choice of Process

- It is important to find a review process that works best for both the jurisdiction and the individual reviewer.
  - Consistency within a jurisdictional plan review group.
  - Each plans examiner will typically develop their own specific process and style.
- The concepts presented here include:
  - a tiered approach
    - Emphasis on key issues
  - a checklist approach
    - Linear approach- IBC Chapter 1- Chapter 12



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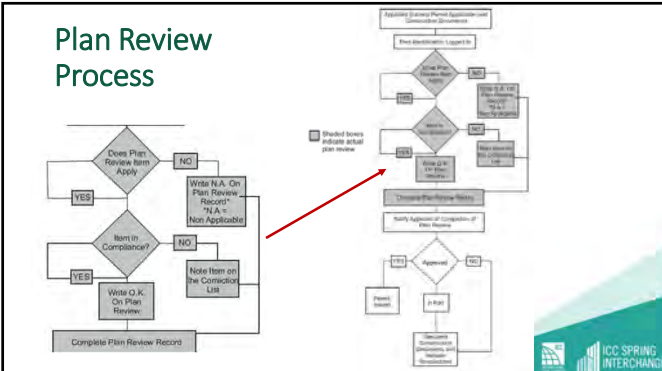
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### Plan Review Process



Shaded boxes indicate actual plan review



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### Checklist approach

- Administration
- Building Planning
  - Occupancy Classification
  - General Building Limitations
  - Special Use and Occupancies
- Fire Protection
  - Fire-Resistance-Rated Construction
  - Interior Finishes
  - Fire Protection and Life Safety Systems



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### Checklist approach

- Occupant Needs
  - Means of Egress
  - General Means of Egress
  - Exit Access
  - Exits/ Exit Discharge
  - Other Means of Egress issues
    - Bleachers
    - Assemblies
    - Emergency Escape and Rescue Openings
  - Accessibility
- Interior Environment



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### Tips for Completing the Plan Review Record

- List the corrections required as you review the plans and specifications.
- Number the required corrections sequentially.
- Use a legend for symbols:
  - NA = Not applicable
  - OK = Complies with applicable code requirements
  - NR = Not Required
  - Note 1, 2, 3, etc. = Reference number to the designated correction list note



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### Review Process

- Although there are a variety of approaches to the plan review process, two general methods are apparent:
  - Sheet-by-sheet progression
  - Progression sequentially through the code
- These methods, or a combination of these methods, can be overwhelming due to the potential scope of the project and the code.
- In addition, while comprehensive, these methods often fall short in addressing the conceptual and performance nature of the review.



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### Hierarchy of the Review

- For this reason, a tiered approach to plan review may best serve the desired goals of accuracy, consistency, efficiency and thoroughness.
- The purpose and value of the tiered approach include:
  - Providing a sequential method of review
  - Stressing the critical importance of building classification
  - Accounting early in process for any need of significant re-design
  - Focusing on importance of fire and life safety



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### Tier concepts



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### Tiers of Review

- Use of 'tiered' approach to plan review allows for emphasis on key issues throughout the process:
  - Tier 1 Items must be in compliance prior to moving to Tier 2
  - Tier 2 Significant issues that must be resolved early
  - Tier 3 Relatively easy to address if issues arise
  - Tier 4 Miscellaneous topics of review
  - Tier 5 Often better addressed in field



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### Tier 1

- Must be provided and approved prior to an in-depth review of next level
- Noncompliance will typically result in need for significant design changes
- Typically includes:
  - Occupancy classification
    - May include applicable occupant load and hazardous materials determination
  - Sprinkler protection, type and extent
    - Fire areas if applicable



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### Tier 1

- Also typically includes:
  - Acceptable and actual construction types
    - Actual and allowable floor area/height
    - Any fire walls, mixed occupancies, podium conditions, multiple buildings on same lot
  - Occupant loads for general means of egress systems
    - Egress from stories
    - Cumulative occupant load distribution
  - Major accessibility issues
    - Areas where required/not required
    - Elevators



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**Tier 2**

- Also considered as significant and typically requires prior resolution of all Tier 1 issues
- Noncompliance may result in considerable design changes
- Major items include:
  - Key means of egress component issues such as exit access stairways and corridors
  - Key means of egress design decisions such as common path, travel through intervening rooms, and single-exit spaces
  - Incidental uses



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**Tier 2**

- Major items also include:
  - Fire alarm and standpipe systems
  - Type of construction continuity
  - Fire-resistance-rated separations
  - Elevator hoistway protection
  - Exterior walls protection due to location on lot
  - General accessibility features



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**Tier 3**

- Can be relatively easy to address if there are issues
- Major items include:
  - Individual means of egress elements such as door swing, panic hardware, exit signs, emergency lighting
  - Accessibility details
  - Type of construction
    - Details of materials and fire-resistance
  - Safety glazing
  - Additional items that are applicable to fire- and life-safety



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**Tier 4**

- This tier includes any code areas that have yet to be addressed.
- Major items include:
  - Sound transmission
  - Ventilation
  - Roof coverings and rooftop structures



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**Tier 5**

- Items that can be better addressed in the field need to be identified and documented to ensure the necessary inspection of such issues is done, including:
  - Interior finishes
  - Directional exit sign location
  - Door force levels
  - Emergency lighting
- Includes those items that are difficult to determine in plan review or more quickly and efficiently addressed through a field review.



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**Tier concepts**

Tier 1 & 2 tasks



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**Review tasks- Tier 1- ICC-Checklist locations**

- Occupancy classification(s)- **Building Planning, Occupancy Classifications**
- Fire Sprinkler Systems- (Type and Extent)- **Building Planning, Fire Protection, Automatic Sprinkler Systems**
- Height, Area limits- (Acceptable and Actual) – **Building Planning, General Building Limits**
  - Construction types- (Acceptable and Actual)
  - Podium buildings, mixed occupancies, fire walls, multiple buildings on one lot
- Occupant loads for general means of egress systems- **Occupant Needs, Means of Egress**
  - Egress from stories
  - Cumulative occupant load distribution
- Major accessibility issues- **Occupant Needs, Accessibility**
  - Areas where required/not required
  - Elevators



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**Review tasks- Tier 2- ICC Checklist locations**

- Key means of egress component issues such as exit access stairways and corridors
  - **Means of Egress, Exit Access**
- Key means of egress design decisions such as common path, travel through intervening rooms, and single-exit spaces- **Means of Egress, Exit Access**
- Incidental uses- **Building Planning, Occupancy Classification**
- Fire alarm and standpipe systems- **Fire Protection and Life Safety**
- Type of construction continuity- **Building Planning, Fire Protection**
- Fire-resistance-rated separations- **Fire Protection**
- Elevator hoistway protection- **Fire Protection, Building Services**
- Exterior walls protection due to location on lot- **Fire Protection**
- General accessibility features- **Means of Egress, Accessibility**



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**Tier concepts**  
Occupancy classifications



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### Basic Occupancies

- 10 occupancy classifications
- Subdivisions lead to 26 classifications
- Based on use and function
- Most important part of plan review process




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### Occupancy Classifications

- Group A (assembly) – civic, social or religious

|     |   |
|-----|---|
| A-1 | ...usually fixed seating, intended for production and viewing of performing arts or motion pictures |
| A-2 | ...food and/or drink consumption  |
| A-3 | ...worship, recreation, or amusement and other uses not classified elsewhere in Group A             |
| A-4 | ...indoor sporting events and activities with spectator seating                                     |
| A-5 | ...participation in or viewing outdoor activities   |




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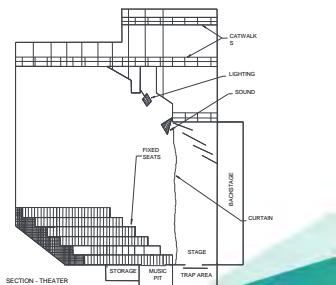

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### Assembly

- Group A-1 Characteristics:
  - High-occupant density
  - Projection booth
  - Catwalks
  - Backstage areas
  - Row seating
  - Raised stage

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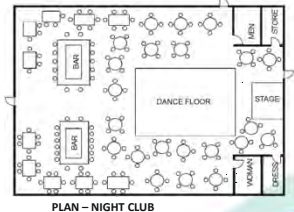
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### Assembly

- Group A-2:
  - Banquet halls
  - Casino (gaming area)
  - Nightclubs
  - Restaurants
  - Taverns and bars



PLAN - NIGHT CLUB

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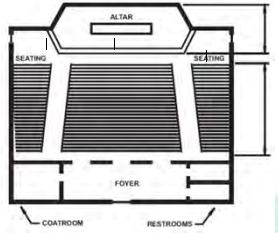
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### Assembly

- Group A-3:
  - Auditoriums
  - Museums
  - Courtrooms
  - Places of religious worship
  - Recreational Centers



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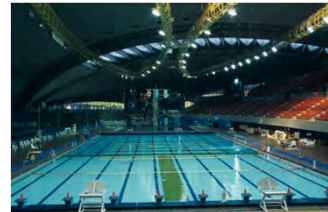
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### Assembly

- Group A-4:
  - Arenas
  - Skating Rinks
  - Swimming pools
  - Tennis courts



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### Assembly

- Group A-5:
  - Amusement Parks
  - Ballparks
  - Bleachers
  - Fairgrounds
  - Grandstands
  - Racetracks
  - Stadiums
  - Tents



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### Occupancy Classifications

- Group B (business)
  - ...office, professional, or service-type transactions, including storage of records and accounts



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### Business

- Group B:
  - Ambulatory Care Facilities (Section 422)
  - Banks
  - Car wash
  - Dry cleaning
  - Laboratories
  - Professional services



PLAN – OUTPATIENT CLINIC

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### Occupancy Classifications

- Group E (educational)

|       |   |
|-------|---|
| E     | ...6+ persons at any one time for educational purposes through 12th grade and child-care facilities |
| Day   | ...5+ children older than 2½ who receive educational, supervision or                                |
| Car e | personal care services < 24 hrs/day   |



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### Educational

- Group E
  - Day care facilities
  - Elementary schools
  - High schools
  - Junior high schools
  - Preschools



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### Occupancy Classifications

- Group F (factory) – assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing not classified H (hazard) or S (storage)

|     |   |
|-----|---|
| F-1 | ...industrial uses not classified as F-2 Low Hazard   |
| F-2 | ...industrial uses involving fabrication or manufacturing of noncombustible materials which during finishing, packing, or processing do not involve a significant fire hazard |



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### Factory/Industrial

- Group F-1:
  - Automobile assembly plant
  - Beverages > 16% alcohol
  - Clothing manufacturers
  - Machinery factories
  - Motion/TV filming studio

LOADING DOCK  
OFFICES  
CLOTHING FACTORY  
MEN  
WOMEN  
LOCKER ROOM  
TRUCK LOADING DOCK

ICC SPRING INTERCHANGE

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### Factory/Industrial

- Group F-2:
  - Ceramic production
  - Beverages up to/incl'd 16%
  - Glass producers
  - Masonry manufacturing
  - Metal fabrication plant

FINISHED TILE  
ASSEMBLY  
RAW MATERIAL STORAGE  
PLAN - CERAMIC TILE PLANT

ICC SPRING INTERCHANGE

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### Occupancy Classifications

- Group H (high hazard) – manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas

|     |   |
|-----|---|
| H-1 | ...materials that pose a detonation hazard  |
| H-2 | ...materials that pose a deflagration hazard or a hazard from accelerated burning   |
| H-3 | ...materials that readily support combustion or that pose a physical hazard   |
| H-4 | ...materials that are health hazards  |
| H-5 | Semiconductor fabrication facilities and comparable research and development areas in which hazardous production materials (HPM) are used |

Whiskey Distillery (not an "H")

§307

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### High Hazard

- Group H-1:
  - Detonable pyrophoric materials
  - Explosives
  - Organic peroxides
  - Oxidizers (Class 4)
  - Unstable (reactive materials, Class 3 detonable and Class 4)
- Group H-2:
  - Combustible dusts
  - Combustible liquids (Class II or IIIA in open systems)
  - Cryogenic liquids, flammable
  - Flammable gases
  - Flammable liquids (Class I in open spaces)

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### High Hazard

- Group H-3:
  - Combustible fibers (other than density packed labeled cotton)
  - Flammable solids
  - Organic peroxides (Class II and Class III)
  - Water-reactive materials (Class 2)
- Group H-4:
  - Corrosives
  - Highly toxic materials
  - Toxic materials
- Group H-5:
  - Related research and development areas
  - Semi-conductor fabrication facility

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### Occupancy Classifications

- Group I (institutional) – care/supervision for persons who
  - May not be capable of self-preservation without physical assistance
  - Are detained for penal/correctional purposes or liberty is restricted

|     |  |
|-----|--|
| I-1 | ...16+ persons, excluding staff, who reside on a 24-hr basis in a supervised environment and receive custodial care  |
| I-2 | ...medical care on a 24-hr basis for 5+ persons who are incapable of self-preservation   |
| I-3 | ...5+ persons who are under restraint or security, generally incapable of self-preservation due to security measures not under occupants' control                    |
| I-4 | ...persons of any age who receive custodial care for less than 24 hrs by individuals other than...relatives...in a place other than the home of the person cared for |

§308



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### Institutional

- Group I-1:
  - Alcohol and drug center
  - Assisted living facilities
  - Congregate care facility
  - Group home
  - Rehabilitation facility
  - Residential board and custodial care facilities

Condition 1- capable  
Condition 2- Ltd. Assist.

KITCHEN  
SUPPLY ROOM  
BEDROOMS  
ENTRY FOYER  
RECREATION ROOM  
LIVING ROOM

ICC SPRING INTERCHANGE

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### Institutional

- Group I-2:
  - Detoxification facilities
  - Foster care facilities
  - Hospital
  - Nursing homes
  - Psychiatric hospital

Condition 1= no emerg care= nursing home  
Condition 2= emerg care= hospital

FREE ACCESS FROM FLOOR  
FREE ACCESS FROM ROOM  
PATIENT ROOM  
FREE ACCESS FROM BUILDING  
PARTIAL PLAN - I-2 USE GROUP

ICC SPRING INTERCHANGE

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### Institutional

- Group I-3:
  - Correctional centers
  - Detention centers
  - Jails
  - Pre-release centers
  - Prisons
  - Reformatories

SMOKE BARRIERS

LUNCH ROOM  
OFFICES  
REC ROOM  
TV ROOM  
SLEEPING ROOMS  
LIBRARY

KEY OPERATION IS NECESSARY FOR EXTERIOR DOORS AND BETWEEN THE COMPARTMENTS  
PRISON

ICC SPRING INTERCHANGE

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### Group I-3

OCCUPANCY CONDITION 1

OCCUPANCY CONDITION 2

OCCUPANCY CONDITION 3

OCCUPANCY CONDITION 4

OCCUPANCY CONDITION 5

DETENTION AND CORRECTIONAL  
OCCUPANCY CONDITIONS:

- L** LOCKED
- RL** LOCKED – REMOTE RELEASE OR EQUIVALENT
- SB** SMOKE BARRIER OR HORIZONTAL EXIT

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### Institutional

- Group I-4:
  - Adult care facilities
    - Less than 24 hours; more than 5 unrelated adults
  - Child care facilities
    - Less than 24 hours; more than 5 children, 2½ years of age or less

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### Occupancy Classifications

- Group M (mercantile)
  - ...display and sale of merchandise which involves stocks of goods, wares or merchandise incidental to such purposes and publicly accessible

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### Mercantile

- Group M:
  - Department stores
  - Motor fuel-dispensing facilities
  - Retail stores
  - Supermarkets



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### Occupancy Classifications

- Group R (residential) – for sleeping purposes when NOT
  - Classified as Institutional Group I
  - Regulated by IRC

|     |   |
|-----|---|
| R-1 | ...sleeping units with primarily transient occupants  |
| R-2 | ...sleeping units or 2+ dwelling units with primarily permanent occupants   |
| R-3 | ...primarily permanent occupants not classified as Group R-1, R-2, R-4, or R-4  |
| R-4 | ...5 to 16 persons, excluding staff, who reside on a 24-hr basis in a supervised residential environment and receive custodial care |



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### Residential

- Group R-1:
  - Congregate living facilities (>10)
  - Boarding houses
  - Hotels
  - Motels
- Group R-2:
  - Apartments
  - Dormitories
  - Congr. Living (>16)
  - Live/work units (Section 508.5)



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### Residential

- Group R-3:
  - Boarding houses (nontransient) (< 16)
  - Boarding houses (transient) (<11)
  - Care facilities
  - Congregate living facilities (nontransient) (<16)
  - Congregate living facilities (transient) (<11)
  - Institutional occupancies (Groups I-1, I-2)
  - One- or two-dwelling units
  - Lodging houses with 5 or less guestrooms, <11 occ's



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### Residential

Condition 1- capable  
Condition 2- Ltd. Assist.

- Group R-4:
  - Alcohol and drug center
  - Assisted living facilities
  - Congregate care facility
  - Group home
  - Rehabilitation facility
  - Residential board and custodial care facilities



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### 24-Hour Care Facilities (Residential)

| Age of Residents | Capability of Residents          | Number of Residents |      |         |
|------------------|----------------------------------|---------------------|------|---------|
|                  |                                  | 1-5                 | 6-16 | Over 16 |
| 2½ years or less | Not capable of self-preservation | R-3 or IRC          | I-2  | I-2     |
| Over 2½ years    | Capable of self-preservation     | R-3 or IRC          | R-4  | I-1     |
| Over 2½ years    | Not capable of self-preservation | R-3 or IRC          | I-2  | I-2     |



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### Daycare Facilities (Less than 24-Hour Care)

| Age of Served Population         | Capability of Served Population  | Number of Served Population |             |
|----------------------------------|----------------------------------|-----------------------------|-------------|
|                                  |                                  | 1-5                         | More than 5 |
| 2½ years or less                 | Not capable of self-preservation | R-3 or IRC                  | I-4*        |
| Over 2½ years through 12th grade | Capable of self-preservation     | R-3 or IRC                  | E           |
| Over 12th grade                  | Capable of self-preservation     | R-3 or IRC                  | A-3, I-4    |
| Over 2½ years                    | Not capable of self-preservation | R-3 or IRC                  | I-4         |



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### Occupancy Classifications

- Group S (storage) – not classified as hazardous

S-1 ...uses that are not classified as Group S-2  
...noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles, or film wrapping.

S-1 = Beverages >16% alcohol  
S-2 = Beverages up to and including 16% alcohol

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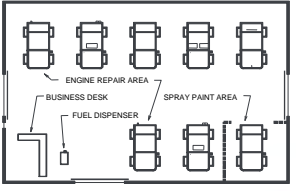

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### Storage

- Group S-1:
  - Aerosols
  - Aircraft hangars
  - Beverages > 16% alcohol**
  - Dry boat storage
  - Lumber centers
  - Motor vehicle repair garages
  - Paper products
  - Textile/clothing storage
  - Tires, bulk storage

**Note:** Accessory storage spaces are part of the occupancy, no size limit. (Section 311.1.1)

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### Storage

- Group S-2:
  - Beverages up to/incl'd 16%
  - Food product storage
  - Glass storage
  - Metal storage
  - Parking garages
  - Pottery storage

PARKING GARAGE

PLAN - PARKING GARAGE

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### Occupancy Classifications

- Group U (utility)
  - ...accessory and miscellaneous structures not classified in any specific occupancy shall conform to IBC commensurate with fire and life hazard incidental to their occupancy
- Group U:
  - Agricultural buildings
  - Barns
  - Carports
  - Greenhouses
  - Private garages
  - Stables

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### Occupancy Classification

| Your Answer             | Building Description  |
|-------------------------|---|
| <u>I-2, Cond 2</u>      | Hospital  |
| <u>R-4, Cond 1 or 2</u> | Assisted living facility with 12 occupants                      |
| <u>F-1</u>              | Auto assembly plant   |
| <u>E</u>                | Day care center with more than 5 children, 2 1/2 years or older |
| <u>A-1</u>              | Movie theater   |
| <u>A-5</u>              | Outdoor race car track  |

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### Classify Occupancy

| Your Answer | Occupancy Choices  |
|-------------|--|
| <u>H-1</u>  | Fireworks factory  |
| <u>R-2</u>  | Apartment building                                       |
| <u>S-1</u>  | Motor vehicle repair shop                                |
| <u>A-2</u>  | Restaurant   |
| <u>B</u>    | Outpatient oral surgery clinic (open less than 24 hours) |
| <u>M</u>    | Motor fuel service station                               |



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### Tier concepts

Fire sprinkler systems



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### Automatic Fire Sprinkler Systems-Design and Installation Requirements §903.3

- NFPA publishes 3 standards governing the design, installation, testing and maintenance of fire sprinkler systems:
  - §903.3.1.1 – NFPA 13, *Installation of Sprinkler Systems*
  - §903.3.1.2 – NFPA 13R, *Installation of Sprinkler Systems in Low-Rise Residential Occupancies*
  - §903.3.1.3 – NFPA 13D, *Sprinkler Systems for One- and Two-Family Dwellings and Manufactured Homes*



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### Application Matrix of the Sprinkler Design Standards

| System Feature                           | Sprinkler Standard   |                                |                                     |
|--|--|--------------------------------|-------------------------------------|
|  | NFPA 13  | NFPA 13R                       | NFPA 13D or IRC §P2904              |
| Extent of Protection                     | Throughout the building  | Occupied spaces                | Occupied spaces                     |
| Design Intent                            | Life Safety & Property Protection  | Life Safety                    | Life Safety                         |
| Applicability                            | All Occupancies  | Group R up to 4-stories or 60' | 1- & 2-family dwellings & Townhomes |
| Design Methods                           | Pipe schedule, Control mode – discharge density/design area, Control mode – specific application, Suppression mode | 4 sprinklers per compartment   | 2 sprinklers per compartment        |
| Sprinklers                               | All listed & approved types  | Listed Residential             | Listed Residential                  |
| Minimum H <sub>2</sub> O Supply Duration | 30 to 120 minutes  | 30 Minutes                     | 7 or 10 Minutes                     |

NFPA 13R– Floor level:  
Highest = 30' or less above LLDVA  
Lowest = 30' or less below LLDVA



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### Checking Automatic Sprinkler Systems

- Six Steps:
  1. Check based on the group occupancy classification of the building or fire area.
  2. Check for a windowless story/basement.
  3. Check rubbish and linen chutes.
  4. Check buildings 55 feet (16,764 mm) or more in height.
  5. Check for incidental uses.(T- 509.1)
  6. Check additional requirements for fire suppression systems.(T- 903.2.11.6)



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## Tier concepts

Types of Construction Classification



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### Types of Construction

- Type IV-A, B and C buildings typically have mass timber and/or noncombustible building elements.
  - Interior mass timber members to be fully protected in Type IV-A, partially protected in Type IV-B, and need not be protected in Type IV-C.
  - In all cases, exterior sides of exterior walls to be protected with noncombustible protection.
  - Fire-resistance solely provided through calculations based on timber size and noncombustible protection.

| MASS TIMBER/ AND OR NONCOMBUSTIBLE |                                  |
|------------------------------------|----------------------------------|
| Type of Construction               | Primary Structural Frame Members |
| Type IV-A                          | 3-hour                           |
| Type IV-B                          | 2-hour                           |
| Type IV-C                          | 2-hour                           |

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### Types of Construction

- Type IV-HT buildings have noncombustible (or FRT wood) exterior walls and interior elements of heavy timber members conforming with Sec. 2304.11.
- Fire-resistance obtained through size of wood members.

| SUPPORTING STRUCTURAL ELEMENTS  | MINIMUM NOMINAL SOLID BURN SIZE |             | MINIMUM GLUED-LAMINATED WET SIZE |             | MINIMUM STRUCTURAL COMPOSITE LAMBER WET SIZE |             |
|---|---------------------------------|-------------|----------------------------------|-------------|--|-------------|
|   | Width, inch                     | Depth, inch | Width, inch                      | Depth, inch | Width, inch                                  | Depth, inch |
| Columns, Framed joists or glued-laminated timber joists that spring from the floor line. Framed timber trusses.   | 8                               | 8           | 6 1/2                            | 8 1/2       | 7  | 7 1/2       |
| Wood beams and girders  | 6                               | 10          | 5                                | 10 1/2      | 5 1/2  | 9 1/2       |
| Columns (roof and ceiling joists), Lower half of wood-frame or glued-laminated joists that spring from the floor line or from grade.  | 6                               | 8           | 5                                | 8 1/2       | 5 1/2  | 7 1/2       |
| Roof joists only  | 6                               | 6           | 5                                | 6           | 5 1/2  | 5 1/2       |
| Upper half of wood-frame or glued-laminated joists that spring from the floor line or from grade. Framed timber trusses and other roof framing. Framed or glued-laminated joists that spring from the top of walls or wall attachments. | 4"                              | 6           | 3"                               | 4 1/2       | 3 1/2"                                       | 5 1/2       |

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### Types of Construction

- Type V buildings may be constructed entirely of combustible or noncombustible materials or may be a combination of such materials.

| ANY MATERIAL THROUGHOUT |  |
|-------------------------|--|
| Type of Construction    | Primary Structural Frame Members and Bearing Walls |
| Type VA                 | 1-hour   |
| Type VB                 | Nonrated   |

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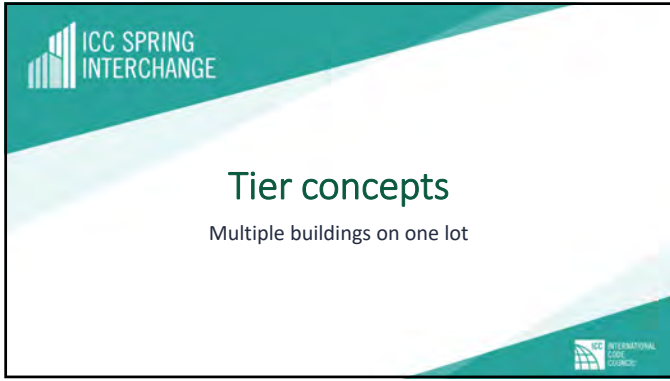
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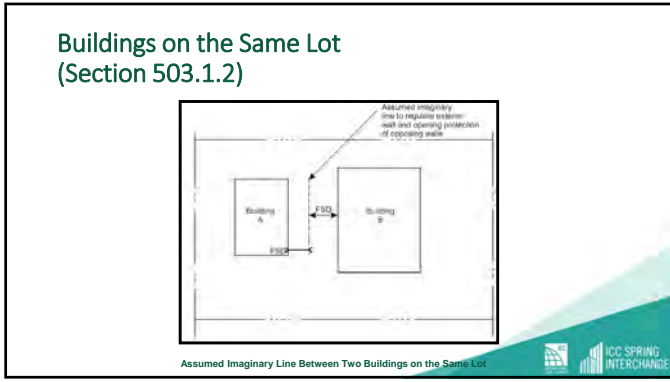
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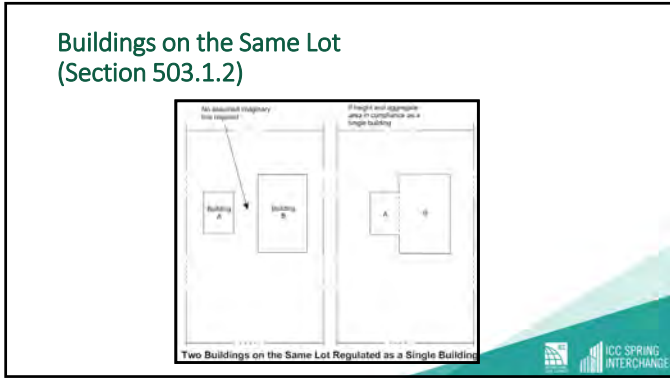
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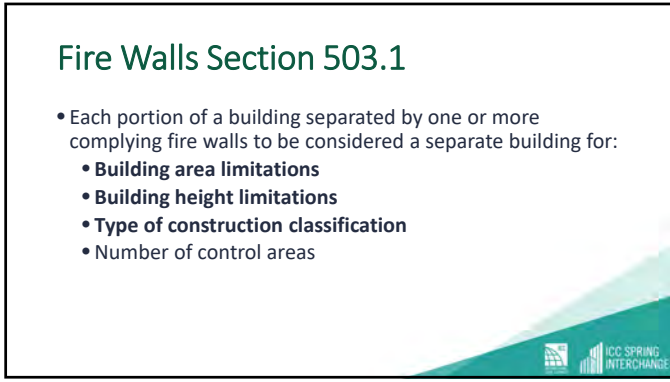
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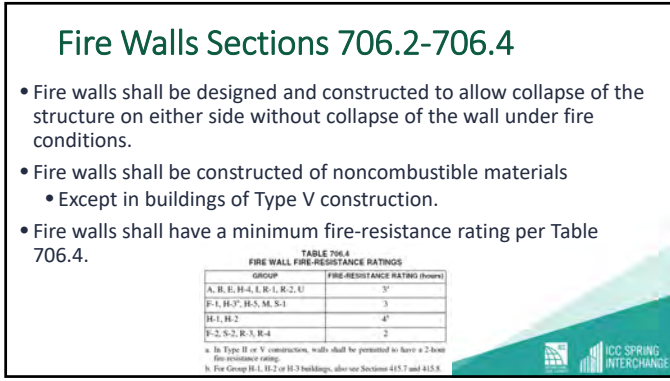
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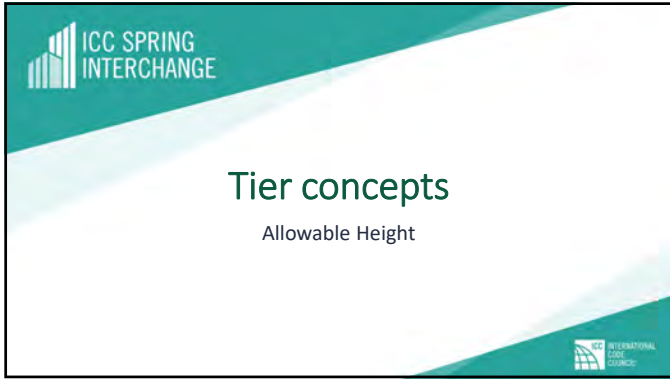
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### Allowable Height (feet)

| OCCUPANCY CLASSIFICATION | Sec Footnotes | TYPE OF CONSTRUCTION |     |         |    |          |    |         |     |    |        |    |    |
|--------------------------|---------------|----------------------|-----|---------|----|----------|----|---------|-----|----|--------|----|----|
|                          |               | Type I               |     | Type II |    | Type III |    | Type IV |     |    | Type V |    |    |
|                          |               | A                    | B   | A       | B  | A        | B  | A       | B   | C  | HT     | A  | B  |
| A, B, E, F, M, S, U      | NS            | UL                   | 160 | 65      | 55 | 65       | 55 | 65      | 65  | 65 | 65     | 50 | 40 |
|                          | S             | UL                   | 180 | 85      | 75 | 86       | 75 | 970     | 180 | 85 | 85     | 70 | 60 |
| R                        | NS            | UL                   | 160 | 65      | 55 | 65       | 55 | 65      | 65  | 65 | 65     | 50 | 40 |
|                          | S13D          | 60                   | 60  | 60      | 60 | 60       | 60 | 60      | 60  | 60 | 60     | 50 | 40 |
|                          | S13R          | 60                   | 60  | 60      | 60 | 60       | 60 | 60      | 60  | 60 | 60     | 60 | 60 |
|                          | S             | UL                   | 180 | 85      | 75 | 85       | 75 | 970     | 180 | 85 | 85     | 70 | 60 |

[Ref. Table 504.3]

ICC SPRING INTERCHANGE

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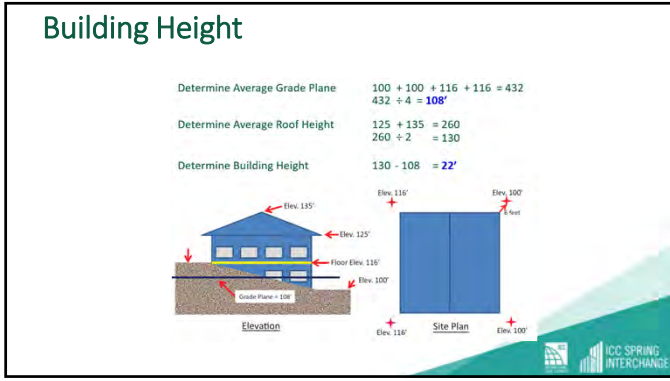
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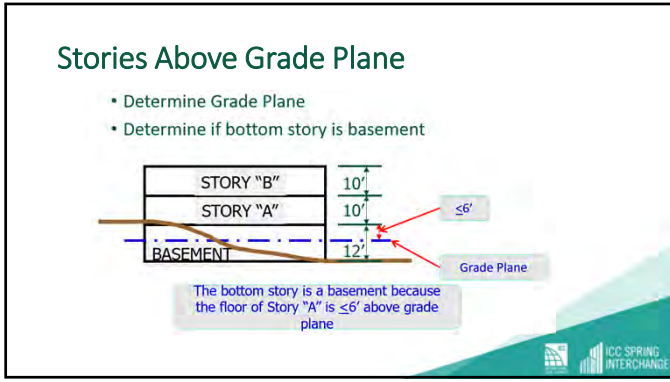
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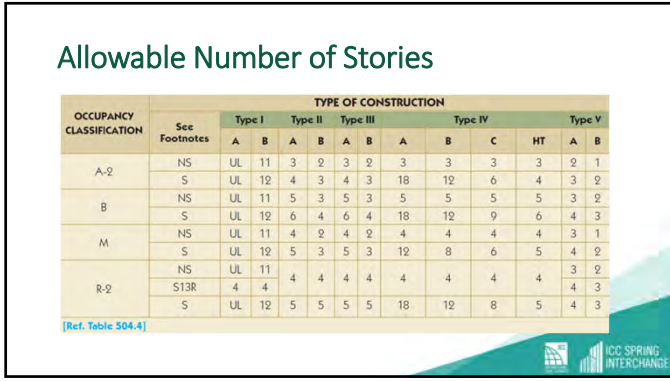
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ICC SPRING INTERCHANGE

## Tier concepts

Occupied Roof

ICC INTERNATIONAL CODE SOURCE

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### Height and Area Limitations

- Occupied roof occupancy based on Table 504.4 for story immediately below
  - (unless Sprinklers and Notification systems)
- Roof area not added to building area regulated by §506

ICC SPRING INTERCHANGE

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### Height and Area Limitations

|                           |                        |                         |
|---------------------------|------------------------|-------------------------|
| A-2 occupancy on roof     |                        |                         |
| B<br>46,000 square feet   |                        |                         |
| B<br>46,000 Square feet   |                        |                         |
| B<br>46,000 Square feet   |                        |                         |
| A-3<br>24,000 square feet | B<br>8,000 Square feet | M<br>14,000 square feet |

**A-2 must be allowed by Table 504.4 to be on the 4<sup>th</sup> floor in order to be allowed on the roof, unless an automatic fire sprinkler system is installed throughout the building. And occupant notification**

ICC SPRING INTERCHANGE

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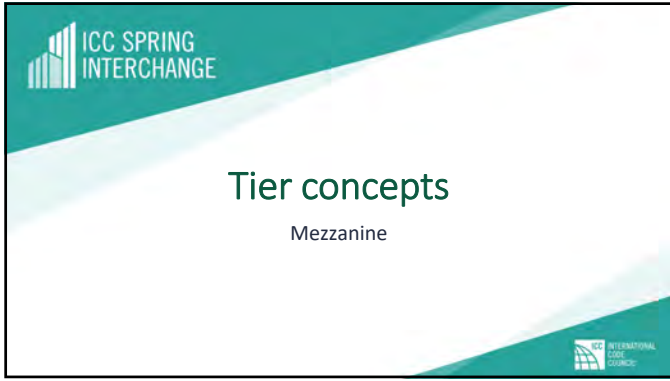
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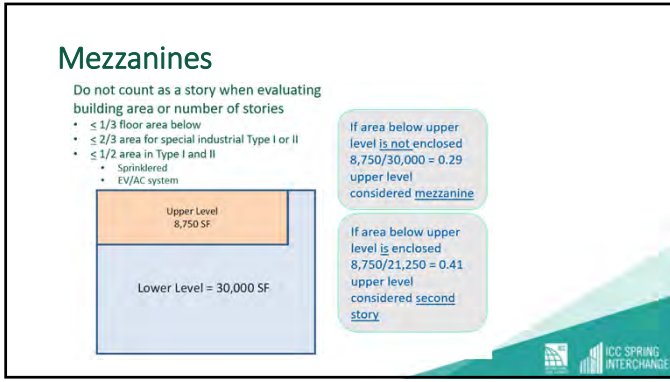
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### Interior Dimensions

- Habitable rooms
  - Room width  $\geq 7'$ 
    - Exception for kitchens with  $\geq 3'$  clear passageway
  - Ceiling height  $\geq 7'-6"$
  - Barrier required to protect occupants from objects protruding into clear height
- Egress path
  - Ceiling height  $\geq 7'-6"$
  - Door height  $\geq 80"$
  - Door width  $\geq 32"$



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### Allowable Building Area Factor (SF)

| OCCUPANCY CLASSIFICATION | See Foot notes | TYPE OF CONSTRUCTION |    |         |       |          |       |         |        |        |        |        |       |
|--------------------------|----------------|----------------------|----|---------|-------|----------|-------|---------|--------|--------|--------|--------|-------|
|                          |                | Type I               |    | Type II |       | Type III |       | Type IV |        | HT     |        | Type V |       |
|                          |                | A                    | B  | A       | B     | A        | B     | A       | B      | C      | HT     | A      | B     |
| A-2                      | NS             | UL                   | UL | 15500   | 9500  | 14000    | 9500  | 45000   | 30000  | 18750  | 15000  | 11500  | 6000  |
|                          | S1             | UL                   | UL | 60000   | 38000 | 50000    | 38000 | 180000  | 120000 | 75000  | 60000  | 46000  | 24000 |
|                          | SM             | UL                   | UL | 46500   | 28500 | 49000    | 28500 | 135000  | 90000  | 56500  | 45000  | 34500  | 18000 |
| B                        | NS             | UL                   | UL | 37500   | 23000 | 28500    | 19000 | 108000  | 70000  | 45000  | 36000  | 18000  | 9000  |
|                          | S1             | UL                   | UL | 150000  | 90000 | 114000   | 76000 | 430000  | 288000 | 180000 | 144000 | 79000  | 36000 |
|                          | SM             | UL                   | UL | 119500  | 69000 | 85000    | 57000 | 294000  | 216000 | 130000 | 108000 | 54000  | 27000 |
| M                        | NS             | UL                   | UL | 21500   | 13500 | 18000    | 13500 | 61500   | 41000  | 26600  | 20000  | 14000  | 9000  |
|                          | S1             | UL                   | UL | 80000   | 50000 | 74000    | 50000 | 246000  | 164000 | 102000 | 82000  | 56000  | 36000 |
|                          | SM             | UL                   | UL | 64500   | 37500 | 55500    | 37500 | 184500  | 123000 | 76875  | 61500  | 42000  | 27000 |
| R-2                      | NS             | UL                   | UL | 24000   | 16000 | 24000    | 16000 | 61500   | 41000  | 26625  | 20500  | 12000  | 7000  |
|                          | S13R           | UL                   | UL | 95000   | 64000 | 96000    | 64000 | 246000  | 164000 | 102000 | 82000  | 48000  | 28000 |
|                          | SM             | UL                   | UL | 72000   | 48000 | 72000    | 48000 | 184500  | 123000 | 76875  | 61500  | 36000  | 21000 |

[Ref. Table 506.2]

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### Allowable Area Determination

$$A_o = A_t + (NS \times I_f) \quad (\text{Eq 5-1})$$

where:

- $A_o$  = Allowable building area per story (ft<sup>2</sup>)
- $A_t$  = Allowable area factor per Table 506.2
- $NS$  = Allowable area factor per Table 506.2 for nonsprinklered building
- $I_f$  = Area increase factor due to frontage per §506.3

§506.2

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### Minimum Frontage Distance ( $W$ )

- Right angle to building
- $W \geq 20$  feet
  - Closest lot line
  - Width of public way
  - Exterior of adjacent building

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### Area Increase for Frontage

- Building perimeter = 1500'
- $W \geq 20$  feet
  - 500
  - 500
  - 250
 } = 1250'
- $W < 20$  feet
  - 250

§506.3.2  $1250/1500 = 83\%$

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### Area Increase for Frontage ( $I_f$ )

- 83% of building perimeter with  $\geq 30'$  open space

| PERCENTAGE OF BUILDING PERIMETER | OPEN SPACE (ft)   |                    |                    |               |
|----------------------------------|-------------------|--------------------|--------------------|---------------|
|                                  | 0 to less than 20 | 20 to less than 25 | 25 to less than 30 | 30 or greater |
| 0 to less than 25                | 0                 | 0                  | 0                  | 0             |
| 25 to less than 50               | 0                 | 0.17               | 0.21               | 0.25          |
| 50 to less than 75               | 0                 | 0.33               | 0.42               | 0.50          |
| 75 to 100                        | 0                 | 0.50               | 0.63               | 0.75          |

TS06.3.3  $I_f = 0.63$

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### Allowable Area for Frontage

- Given
  - Type IIA Business occupancy
  - With sprinklers
  - Three story with single occupancy
    - $A_o = SM = 112,500$

$A_o = A_t + (NS \times I_f)$   
 $A_o = 112,500 + (37,500 \times 0.63)$   
 $A_o = 112,500 + 23,625$   
 $A_o = 136,125 > 125,000$  **OK**

506.2

| OCCUPANCY CLASSIFICATION | Sec Foot notes | Type I |    | Type II |       |
|--------------------------|----------------|--------|----|---------|-------|
|                          |                | A      | B  | A       | B     |
| A-2                      | NS             | UL     | UL | 15500   | 9500  |
|                          | S1             | UL     | UL | 65000   | 38000 |
|                          | SA             | UL     | UL | 44000   | 95000 |
| B                        | NS             | UL     | UL | 37500   | 23000 |
|                          | S1             | UL     | UL | 150000  | 90000 |
|                          | SA             | UL     | UL | 110000  | 69000 |

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### Single Occupancy – Multi-story

$A_o = [A_t + (NS \times I_f)] \times S_o$  (Eq 5-2)

where terms defined earlier except:

$S_o$  = Actual number of stories above grade plane  $\leq 3$   
 For buildings with NFPA 13R sprinkler system,  $S_o \leq 4$

506.2

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### Floor Area in Multi-story Building

Type IIA Group B Office – Nonsprinklered  
Table 506.2: NS = 37,500 ft<sup>2</sup>

1-story building: Max. 37,500 ft<sup>2</sup>  
 2-story building: Max. 37,500 ft<sup>2</sup> (per floor), Max. 75,000 ft<sup>2</sup> (total)  
 3-story building: Max. 37,500 ft<sup>2</sup> (per floor), Max. 112,500 ft<sup>2</sup> (total)  
 4-story building: 28,125 ft<sup>2</sup> (per floor), Max. 112,500 ft<sup>2</sup> (total)

506.2

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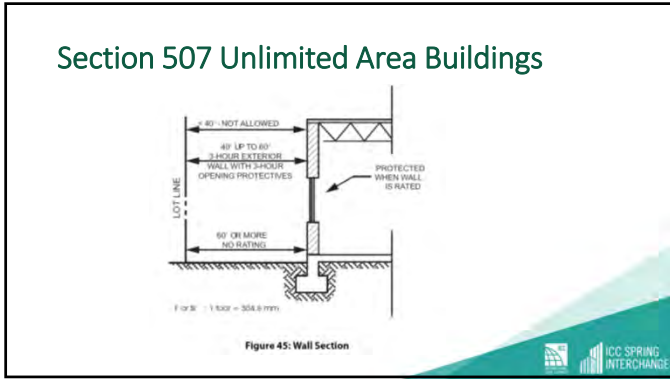
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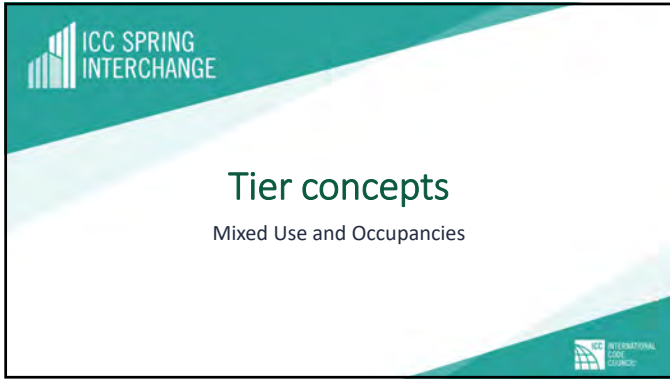
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### Mixed-use and Occupancy

TABLE 508.4 Required Separation of Occupancies (Hours)

| Occupancy      | I-1, I-3, |    |     |    | B, F-1, M, S-1 |        |    |        |    |     |    |     |    |          |    |     |    |    |    |    |
|----------------|-----------|----|-----|----|----------------|--------|----|--------|----|-----|----|-----|----|----------|----|-----|----|----|----|----|
|                | A, E      |    | I-2 |    | R              | F-2, U |    | S-2, U |    | 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 |    |    |    |
| A, E           | N         | N  | 1   | 2  | 2              | NP     | 1  | 2      | N  | 1   | 1  | 2   | NP | NP       | 3  | 4   | 2  | 3  | 2  | NP |
| I-1, I-3, I-4  | 1         | 2  | N   | N  | 2              | NP     | 1  | NP     | 1  | 2   | 1  | 2   | NP | NP       | 3  | NP  | 2  | NP | 2  | NP |
| I-2            | 2         | NP | 2   | NP | N              | 2      | NP | 2      | NP | 2   | NP | NP  | NP | 3        | NP | 2   | NP | 2  | NP |    |
| R              | 1         | 2  | 1   | NP | 2              | NP     | N  | N      | 1  | 2   | 1  | 2   | NP | NP       | 3  | NP  | 2  | NP | 2  | NP |
| F-2, S-2, U    | N         | 1  | 1   | 2  | 2              | NP     | 1  | 2      | N  | N   | 1  | 2   | NP | NP       | 3  | 4   | 2  | 3  | 2  | NP |
| B, F-1, M, S-1 | 1         | 2  | 1   | 2  | 2              | NP     | 1  | 2      | 1  | 2   | N  | N   | NP | NP       | 2  | 3   | 1  | 2  | 1  | NP |
| H-1            | NP        | NP | NP  | NP | NP             | NP     | NP | NP     | NP | NP  | NP | NP  | NP | NP       | NP | NP  | NP | NP | NP | NP |
| H-2            | 3         | 4  | 3   | NP | 3              | NP     | 3  | NP     | 3  | 4   | 2  | 3   | NP | NP       | N  | NP  | 1  | NP | 1  | NP |
| H-3, H-4       | 2         | 3  | 2   | NP | 2              | NP     | 2  | NP     | 2  | 3   | 1  | 2   | NP | NP       | 1  | NP  | 1  | NP | 1  | NP |
| H-5            | 2         | NP | 2   | NP | 2              | NP     | 2  | NP     | 2  | NP  | 1  | NP  | NP | NP       | 1  | NP  | 1  | NP | N  | NP |

Footnotes not shown

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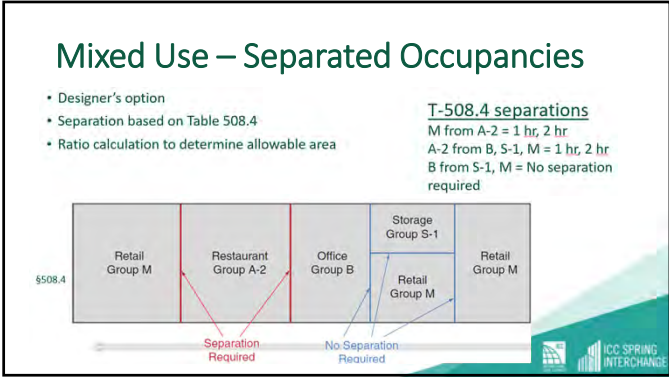
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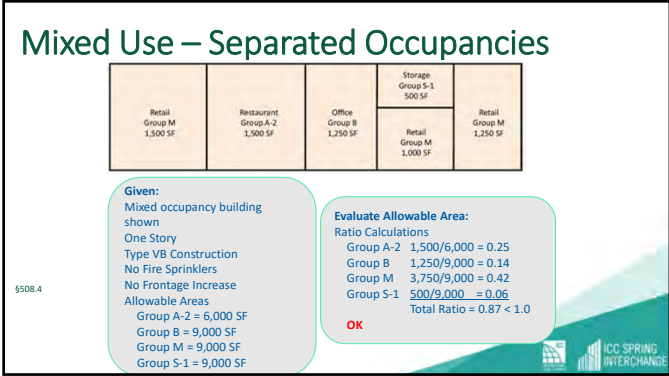
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### Mixed Use – Nonseparated Occupancies

- Most restrictive requirement of each occupancy applied to entire building
- Height
- Area
- Chapter 9

Given:  
 Above mixed occupancy building  
 One Story  
 Type VB Construction  
 Fire Sprinklers Provided  
 No Frontage Increase  
 Most restrictive occupancy is the Group A-2

Evaluate: Allowable Area:  
 Most restrictive occupancy = Group A-2  
 Allowable Area = 24,000 SF  
 Actual Building Area = 7,000 SF

No Separation Required Between Any Occupancies

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## Tier concepts

### Podium Buildings

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### Horizontal Building Separation Section 510.2

Occupancies can include Groups A (OL <300), B, M, R, and/or S in upper building

Single building for height limit in feet

Grade plane

Type I construction  
 All occupancies permitted except Group H

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

- Allowable area
- Number of stories
- Fire wall continuity

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### Parking Beneath Group R Section 510.4

- Where parking is limited to the first story, the number of stories used in the determination of the minimum type of construction may be measured from the floor above the garage.

The singular benefit provided by Section 510.4 is the allowance for an additional story above grade plane without requiring a higher type of construction.

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## Tier concepts

Means of Egress

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### TABLE 1004.5 MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

| FUNCTION OF SPACE   | OCCUPANT LOAD FACTOR* |
|---|-----------------------|
| Accessory storage areas, mechanical equipment rooms   | 500 gross             |
| Agricultural building   | 300 gross             |
| Animal housing  | 500 gross             |
| Assembly kitchen  | 20 gross              |
| Baggage claim   | 20 gross              |
| Baggage handling  | 100 gross             |
| Circulation   | 100 gross             |
| Waiting areas   | 15 gross              |
| Assembly  |                       |
| Cinema, theater, club, etc.   | 15 gross              |
| Exhibit gallery and museum  | 90 net                |
| Assembly with fixed seats   | See Section 1004.6    |
| Assembly without fixed seats  |                       |
| Conventional theater only—total floor   | 7 net                 |
| Standing space  | 5 net                 |
| Theater (without public exit capacity)  | 15 net                |
| Benching capacity, where 2 people for each seat including 15 net of capacity, and 10 additional seats | 7 net                 |
| Theater areas   | 150 gross             |
| Conventional business meeting areas   | See Section 1004.6    |
| Conventions—other than fixed seating areas  | 40 net                |
| Theater   | 15 net                |
| Dormitories   | 50 gross              |

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### TABLE 1004.5 MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

|   |                     |
|---|---------------------|
| Educational                                   |                     |
| Classrooms                                    | 20 sqft             |
| Shops and other vocational/semi-voc           | 50 sqft             |
| Classroom lecture                             | 50 sqft             |
| Group IT/ fabrication and manufacturing areas | 200 sqft            |
| Industrial areas                              | 100 sqft            |
| Institutional areas                           |                     |
| Impatient treatment areas                     | 240 sqft            |
| Operational areas                             | 100 sqft            |
| Shipping areas                                | 120 sqft            |
| Kitchens, commercial                          | 200 sqft            |
| Libraries                                     |                     |
| Reading rooms                                 | 50 sqft             |
| Stack areas                                   | 100 sqft            |
| Locker rooms                                  | 50 sqft             |
| Mall buildings—covered and open               | See Section 402.8.2 |
| Mercantile                                    | 60 sqft             |
| Storage, stock, shipping areas                | 400 sqft            |
| Parking garages                               | 200 sqft            |
| Residential                                   | 200 sqft            |
| Swimming pools, swimming pools, hot and cold  | 50 sqft             |
| Decks   | 15 sqft             |
| Stages and platforms                          | 50 sqft             |
| Warehouses                                    | 500 sqft            |

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### Egress System Design

- Areas with fixed seating
  - Occupant load based on number of fixed seats
- Benches
  - Pews = 18"/person
  - Dining = 24"/person



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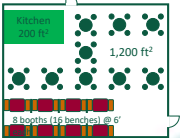
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### Occupant Load Calculation

- Restaurant with 1,200 ft<sup>2</sup> of chairs and booths
- 8 booths (16 benches) – 6' wide each
- 200 ft<sup>2</sup> kitchen
  - Kitchen 200/200 = 1
  - Dining Area 1,200/15 = 80
  - Booths 6'/24" = 3/bench = 48
  - Total 1 + 80 + 48 = 129

§1004.5  
§1004.6



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### Minimum Number of Exits from Stories and Occupied Roofs Section 1006.3.3

- Each story and occupied roof to have minimum number of exits, or access to exits, as set forth in Table 1006.3.3.

**TABLE 1006.3.3  
MINIMUM NUMBER OF EXITS OR  
ACCESS TO EXITS PER STORY**

| OCCUPANT LOAD PER STORY | MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS FROM STORY |
|-------------------------|---|
| 1-500                   | 2   |
| 501-1,000               | 3   |
| More than 1,000         | 4   |



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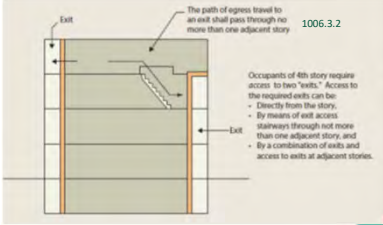

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### Egress from Stories and Occupied Roofs Section 1006.3

- Each story and occupied roof to have minimum number of exits, or access to exits, as set forth in Table 1006.3.3.

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### Single Exits Section 1006.3.4

- A single exit or access to a single exit permitted where in compliance with Table 1006.3.4(1) or 1006.3.4(2)

**TABLE 1006.3.4(1)  
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR R-2 OCCUPANCIES**

| STORY  | OCCUPANCY        | MAXIMUM NUMBER OF DWELLING UNITS | MAXIMUM EXIT ACCESS TRAVEL DISTANCE |
|--|------------------|----------------------------------|-------------------------------------|
| Basement, first, second or third story above grade plane | R-2 <sup>a</sup> | 4 dwelling units                 | 125 feet                            |
| Fourth story above grade plane and higher                | NP               | NA                               | NA                                  |

For SI: 1 foot = 304.8 mm.  
 NP = Not Permitted.  
 NA = Not Applicable.  
 a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.1.1.2 and provided with emergency escape and rescue openings in accordance with Section 1011.  
 b. This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, see Table 1006.3.4(2).



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### Table 1006.3.4(2) Stories With One Exit Or Access To One Exit For Occupancies Other Than Group R-2

TABLE 1006.3.4(2)  
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT FOR OTHER OCCUPANCIES

| STORY                                    | OCCUPANCY                                    | MAXIMUM OCCUPANT LOAD PER STORY | MAXIMUM EXIT ACCESS TRAVEL DISTANCE (feet) |
|--|--|---------------------------------|--|
| First story above or below grade plane   | A, B <sup>a</sup> , E, F <sup>b</sup> , M, U | 49                              | 75   |
|  | H-2, H-3                                     | 3                               | 25   |
|  | H-4, H-5, I, R-1, R-2 <sup>c</sup>           | 10                              | 75   |
|  | S <sup>a</sup>                               | 29                              | 75   |
| Second story above grade plane           | B, F, M, S <sup>a</sup>                      | 29                              | 75   |
| Third story above grade plane and higher | NP   | NA                              | NA   |

For SE: 1 foot = 304.8 mm.  
 NP = Not Permitted.  
 NA = Not Applicable.  
 a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1011.  
 b. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum exit access travel distance of 100 feet.  
 c. This table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1006.1.4(1).  
 d. The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 100 feet.



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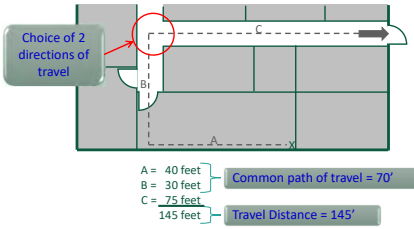
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### Travel Distance Measurement

- Measurement is to "nearest" exit



Choice of 2 directions of travel

A = 40 feet  
 B = 30 feet  
 C = 75 feet  
 145 feet

Common path of travel = 70'  
 Travel Distance = 145'

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### TABLE 1017.2 EXIT ACCESS TRAVEL DISTANCE

TABLE 1017.2  
EXIT ACCESS TRAVEL DISTANCE<sup>a</sup>

| OCCUPANCY            | WITHOUT SPRINKLER SYSTEM (feet) | WITH SPRINKLER SYSTEM (feet) |
|----------------------|---------------------------------|------------------------------|
| A, E, F-1, M, R, S-1 | 200 <sup>b</sup>                | 250 <sup>b</sup>             |
| I-1                  | Not Permitted                   | 250 <sup>b</sup>             |
| B                    | 200                             | 300 <sup>c</sup>             |
| F-2, S-2, U          | 300                             | 400 <sup>c</sup>             |
| H-1                  | Not Permitted                   | 75 <sup>d</sup>              |
| H-2                  | Not Permitted                   | 100 <sup>d</sup>             |
| H-3                  | Not Permitted                   | 150 <sup>d</sup>             |
| H-4                  | Not Permitted                   | 175 <sup>d</sup>             |
| H-5                  | Not Permitted                   | 200 <sup>e</sup>             |
| I-2, I-3             | Not Permitted                   | 200 <sup>e</sup>             |
| I-4                  | 150                             | 200 <sup>e</sup>             |



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### Minimum Number of Exits or Exit Access Doorways

Section 1006.2.1

- Every space shall have access to at least one MOE
- Two MOE when the occupant load is above the threshold in Table 1006.2.1
- Two MOE when the common path of travel is exceeded

EXAMPLE

Area = 1200 ft<sup>2</sup>  
O.L. Factor = 60 / person  
O.L. = 20

Table 1006.2.1:  
only one MOE ≤ 49

Retail  
O.L. = 20

Allowable Common Path of Travel = 75'

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### TABLE 1006.2.1 SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

TABLE 1006.2.1  
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY  
MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)

| OCCUPANCY     | MAXIMUM OCCUPANT LOAD OF SPACE | Without Sprinkler System (feet) |         |      | With Sprinkler System (feet) |
|---------------|--------------------------------|---------------------------------|---------|------|------------------------------|
|               |                                | Occupant Load                   |         | 100' |                              |
|               |                                | OL ≤ 50                         | OL > 50 |      |                              |
| A-1, M        | 49                             | 75                              | 75      | 75'  |                              |
| B             | 49                             | 100                             | 75      | 100' |                              |
| F             | 49                             | 75                              | 75      | 100' |                              |
| H-1, H-2, H-3 | 5                              | NP                              | NP      | 25'  |                              |
| H-4, H-5      | 10                             | NP                              | NP      | 25'  |                              |
| I-1, I-2, I-4 | 10                             | NP                              | NP      | 25'  |                              |
| I-3           | 10                             | NP                              | NP      | 100' |                              |
| R-1           | 10                             | NP                              | NP      | 75'  |                              |
| R-2           | 20                             | NP                              | NP      | 125' |                              |
| R-3           | 20                             | NP                              | NP      | 125' |                              |
| R-4           | 20                             | NP                              | NP      | 125' |                              |
| S             | 20                             | 100                             | 75      | 100' |                              |
| U             | 49                             | 100                             | 75      | 75'  |                              |

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### Common Path of Egress Travel

Sections 202, 1006.2

- COMMON PATH OF EGRESS TRAVEL. That portion of the exit access travel distance measured from the **most remote point** within a story to that point where the occupants have separate and distinct access to two exits or exit access doorways.

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### Common Path of Egress Travel

Sections 202, 1006.2

Common Path of Travel?  
NO

Common path of egress travel ends where there is choice of separate access to two exits or exit access doorways.

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### Minimum Exits or Exit Access per Story

TABLE 1006.3.3 MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS PER STORY

| OCCUPANT LOAD PER STORY | MINIMUM NUMBER OF EXITS OR ACCESS TO EXITS FROM STORY |
|-------------------------|---|
| 1-500                   | 2   |
| 501-1,000               | 3   |
| More than 1,000         | 4   |

Occupant Load  
501 to 1,000

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### Remoteness of Exits/ Exit Access

- Check remoteness of exits/ exit access when 2 (or more) are required.

DIAGONAL OF SPACE  
1/2 DIAGONAL

PLAN - ROOM OR BUILDING (Without SPRINKLERS)

1/3 DIAGONAL

PLAN - ROOM OR BUILDING (With SPRINKLERS)

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### Check interior exit stairs

- Check interior vertical exit enclosures.

**PROHIBITED**      **PLAN - STAIR**

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### Check exterior walls of interior stairs

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### Check exterior stair location

**Figure 89: Exterior Stairway Adjacent to Lot Line**

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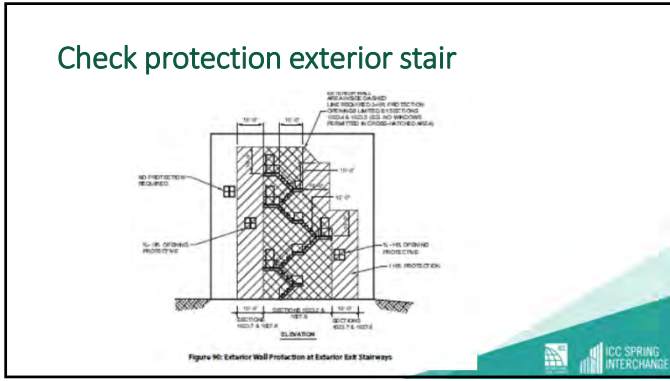
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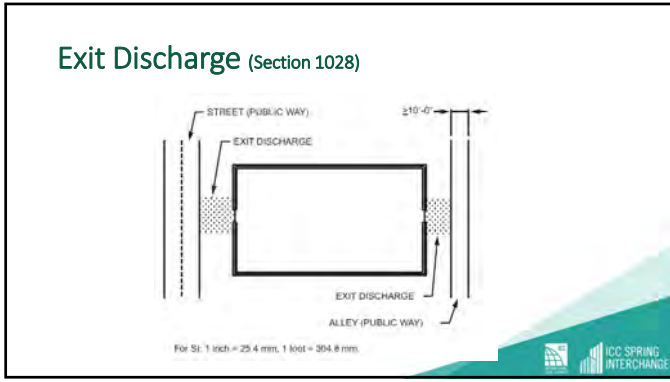
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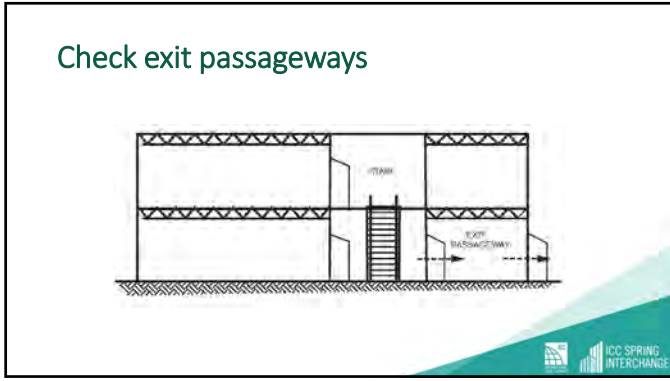
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### Exit Discharge

- Check level of discharge.
- (Section 1028.2, Exception 1)

EXIT STAIRWAY LEADS TO LOBBY

LOBBY

2 HR.

2 HR.

1 HR.

2 HR.

SUPPRESSION SYSTEM REQUIRED IN SHADED AREAS

ICC SPRING INTERCHANGE

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### Vestibules and Exit Passageway

INTERIOR

STAIR ENCLOSURE

EXTERIOR

SELF-CLOSING DOORS

SELF-CLOSING WINDOWS

EXIT PASSAGEWAY 6'-2" IN HEIGHT

PLAN - VESTIBULE

For 51.1 inch x 25.4 mm

ICC SPRING INTERCHANGE

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### Check door size

- Check minimum clear width of egress doors

32" CLEAR WIDTH

PLAN - DOOR OPENING

For 51.1 inch x 25.4 mm

ICC SPRING INTERCHANGE

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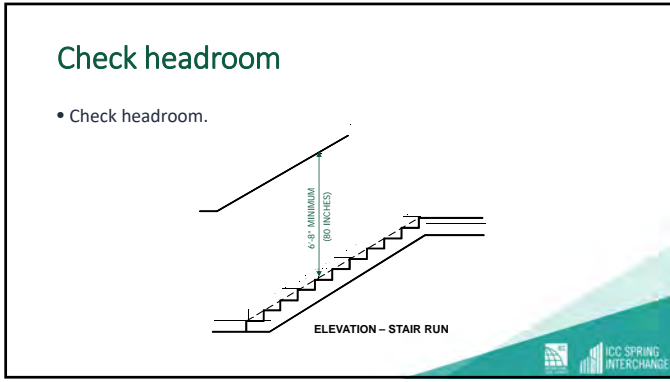
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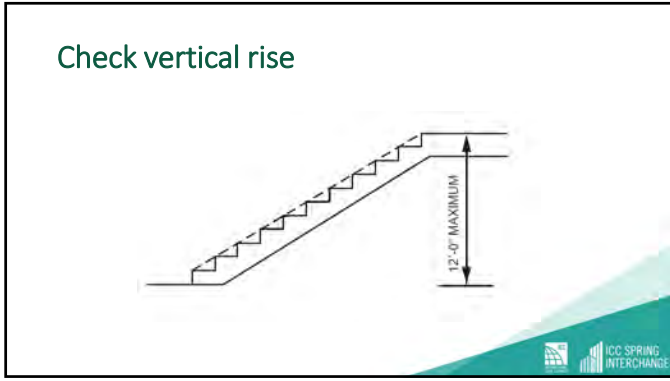
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### Check treads and risers

- Check treads and risers.

For SI: 1 inch = 25.4 mm.

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### Check door swing

For SI: 1 inch = 25.4 mm.

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### Check Exit Access

Check Door Encroachment

For SI: 1 inch = 25.4 mm.

PLAN - CORRIDOR

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ICC SPRING INTERCHANGE

## Tier concepts

Major Accessibility

ICC INTERNATIONAL CODE COUNCIL

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## Accessibility

- IBC requirements similar to
  - ADA Accessibility Guidelines
  - Federal Fair Housing Act
- Referenced standard
  - ICC A117.1 – *Accessible and Usable Buildings and Facilities (2017 edition)*
- Areas not requiring accessibility
  - Construction sites
  - Detached 1- & 2-family dwellings
  - Spaces containing equipment
  - Coolers and freezers

ICC SPRING INTERCHANGE

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## Accessible Path Into a Building

- Accessible path from points where people arrive
  - Public transportation stops
  - Parking spaces
  - Passenger loading zones
  - Public streets or sidewalks
- 60% of public entrances must be accessible

ICC SPRING INTERCHANGE

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### Accessible Path Through a Building

- Accessible route throughout from accessible entrance
- Route to other floors
  - Ramps
    - Slope  $\leq$  1:12
  - Elevators
    - Cars sufficient for wheelchair and one extra person
    - Controls reachable from a wheelchair

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### Accessible Toilet Facilities

- Toilet rooms
  - All accessible
  - Family or assisted-use toilet room in Groups A and M
- Water closets
  - $\geq$ 1 water closet wheelchair accessible



Circular Turning Space (New Buildings)



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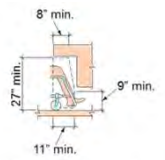
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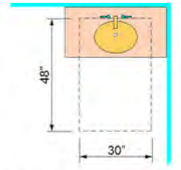
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### Accessible Lavatories and Sinks


- $\geq$ 5% of lavatories accessible
  - $\geq$ 1 in each toilet facility



Knee and Toe Clearance



Clear Floor Space at Lavatory



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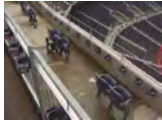
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### Accessible Seating Areas



- Dining
  - Total area for seating, interior/exterior, with some exceptions
  - 5% dining surfaces
- Other than dining
  - Dispersed throughout

| CAPACITY OF SEATING IN ASSEMBLY AREAS | MINIMUM REQUIRED NUMBER OF WHEELCHAIR SPACES                           |
|---------------------------------------|--|
| 4-25                                  | 1  |
| 26-50                                 | 2  |
| 51-100                                | 4  |
| 101-300                               | 5  |
| 301-500                               | 6  |
| 501-5,000                             | 6, plus 1 for each 150, or fraction thereof, between 501 through 5,000 |
| 5,001 and over                        | 36 plus 1 for each 300, or fraction thereof, over 5,000                |

[Ref. IBC Table 1109.2.9.1]

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### R-1 Accessible Dwelling/Sleeping Units

| TOTAL NUMBER OF UNITS PROVIDED | MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITHOUT ROLL-IN SHOWERS | MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITH ROLL-IN SHOWERS | TOTAL NUMBER OF REQUIRED ACCESSIBLE UNITS |
|--------------------------------|---|--|---|
| 1 to 25                        | 1   | 0  | 1   |
| 26 to 50                       | 2   | 0  | 2   |
| 51 to 75                       | 3   | 1  | 4   |
| 76 to 100                      | 4   | 1  | 5   |
| 101 to 150                     | 5   | 2  | 7   |
| 151 to 200                     | 6   | 2  | 8   |
| 201 to 300                     | 7   | 3  | 10  |

[Ref. Table 1108.6.1.1]

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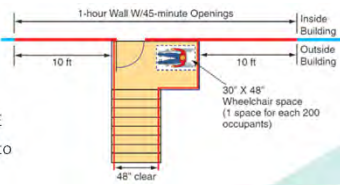
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### Accessible Means of Egress

- Nonsprinklered buildings requiring
  - One exit needs 1 accessible MOE
  - ≥ 2 exits needs 2 accessible MOE
- >4 stories
  - Elevator as 1 accessible MOE
- Accessible MOE must continue to public way or Area of Assisted Rescue



(unless bldg. is sprinklered)

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### Accessible Areas of Refuge

- One wheelchair space for every 200 occupants
  - Not required in sprinklered buildings
- Location
  - Stairway enclosure
  - Elevator lobby
- 2-way communication required

36" x 52" Wheelchair spaces

Exit Path

48" clear width

ICC SPRING INTERCHANGE

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## Tier concepts

Tier 2

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### Check Exit Access

- **Three Steps:**
  1. Check egress through intervening spaces.
  2. Check exit access travel distance.
  3. Check exit access corridors
    - 3.1. Determine the fire-resistance rating.
    - 3.2. Determine the minimum width.
    - 3.3. Check door encroachment.
    - 3.4. Check the length of dead-end corridors.
    - 3.5. Check air movement.

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### Check Exit Access

- Check adjoining spaces.

SPACE IS AN ACCESSORY USE (NOT A HIGH-HAZARD OCCUPANCY)

EXIT PATH

OPENINGS NOT SUBJECT TO LOCKING FROM ACCESS SIDE

EXIT

BUILDING PLAN

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### Check Exit Access

Check minimum width

48" TYP.

36" FOR MOVING BEDS IN GROUP I, 2

72" IN SCHOOLS ≥ 100 OCCUPANTS OR GURNEY TRAFFIC IN OCCUPANCIES WHERE PATIENTS RECEIVE OUTPATIENT MEDICAL CARE

36" WHEN SERVING LESS THAN 50 OR WITHIN DWELLING UNIT

24" FOR ACCESS TO MECHANICAL, ELECTRICAL OR PLUMBING EQUIPMENT

For SI: 1 inch = 25.4 mm.

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### Check Exit Access

- Check the length of dead end corridors.

20'-0" MAX. DEAD END

ROOM

ROOM

ROOM

ROOM

CORRIDOR

EXIT

For SI: 1 inch = 25.4 mm, 1 inch = 25.4 mm.

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### Incidental Uses

- Ancillary functions
- Higher hazards
- Protection per Table 509.1
  - Fire-rated construction, or
  - Fire sprinklers
    - Room constructed to resist smoke passage

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### Incidental Uses

| Room or Area   | Separation (hours) and/or Sprinkler Protection (S) |
|--|--|
| Furnace >400,000 Btu/hour input                                  | 1 or S   |
| Boilers >15 psi and 10 HP  | 1 or S   |
| Refrigerant machinery room                                       | 1 or S   |
| Incinerator rooms  | 2 and S  |
| Paint shops  | 2 or (1 and S)                                     |
| Group E laboratories and vocational shops                        | 1 or S   |
| Group I-2 laboratories   | 1 or S   |
| Group I-2 laundry rooms over 100 SF                              | 1  |
| Group I-3 cells and Group I-2 patient rooms with padded surfaces | 1  |
| Group I-2 physical plant maintenance shops                       | 1  |

T509.1 Excerpt



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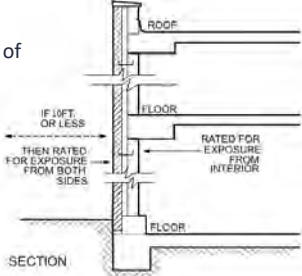
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### Fire-Resistance Ratings

- Fire-resistance rating of exterior wall
- Using Table 705.5



SECTION

For SI: 1 inch = 25.4 mm.



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### Table 705.5 F.R.R. Exterior Walls per F.S.D.

**TABLE 705.5 FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE<sup>a, b, c, d</sup>**

| FIRE SEPARATION DISTANCE = X (feet) | TYPE OF CONSTRUCTION | OCCUPANCY GROUP <sup>e</sup> | OCCUPANCY GROUP F-1, M, S-1 <sup>f</sup> | OCCUPANCY GROUP A, B, E, F-2, I, R <sup>g</sup> , S-2, U <sup>h</sup> |
|-------------------------------------|----------------------|------------------------------|--|---|
| X < 5 <sup>i</sup>                  | All                  | 3                            | 2  | 1   |
|                                     | IA, IVA              | 3                            | 2  | 1   |
| 5 ≤ X < 10                          | Others               | 2                            | 1  | 1   |
|                                     | IA, IB, IVA, IVB     | 2                            | 1  | 1 <sup>i</sup>  |
| 10 ≤ X < 30                         | IB, VB               | 1 <sup>j</sup>               | 0  | 0   |
|                                     | Others               | 1                            | 1  | 1 <sup>i</sup>  |
|                                     | All                  | 0                            | 0  | 0   |

<sup>k</sup> See Section 705.11 for party walls.  
<sup>l</sup> Overlapping joints complying with Section 705.2 shall not be required to have a fire-resistance rating.  
<sup>m</sup> The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the lobby it adjoins the wall is located.  
<sup>n</sup> For special requirements for Group M occupancies, see Section 712.11.  
<sup>o</sup> For special requirements for Group U occupancies, see Section 712.11.  
<sup>p</sup> Where Table 705.5 permits fire-resistance ratings with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.  
<sup>q</sup> For a building containing only a Group U occupancy where garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 3 feet (914 mm) or greater.  
<sup>r</sup> For a Group B-3 building of Type III or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 3 feet (914 mm) or greater.

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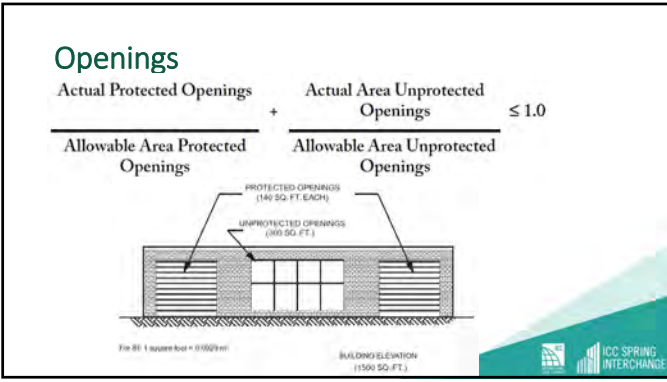
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### Table 705.8 Max Area of Ext. Wall Openings

| TYPE OF EXTERIOR WALL | MAXIMUM AREA OF EXTERIOR WALL OPENINGS (SQ. FEET) |              |
|-----------------------|---|--------------|
|                       | TYPE OF OPENING                                   | MAXIMUM AREA |
| Type III-B            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-C            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-D            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-E            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-F            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-G            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-H            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-I            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-J            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-K            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-L            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-M            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-N            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-O            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-P            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-Q            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-R            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-S            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-T            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-U            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-V            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-W            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-X            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-Y            | Protected   | 140          |
|                       | Unprotected                                       | 300          |
| Type III-Z            | Protected   | 140          |
|                       | Unprotected                                       | 300          |

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### Table 705.8 Max Area of Ext. Wall Openings

TABLE 705.8 MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATOR DISTANCE AND DEGREE OF OPENING PROTECTION

| FIRE SEPARATOR DISTANCE (ft/m) | DEGREE OF OPENING PROTECTION         | ALLOWABLE AREA*            |
|--------------------------------|--------------------------------------|----------------------------|
| 0 ft/m or less                 | Unprotected Noncombustible (U.P. NB) | Not Permitted <sup>b</sup> |
|                                | Unprotected Steel Deck (U.S.D)       | Not Permitted <sup>b</sup> |
|                                | Protected <sup>c</sup>               | Not Permitted <sup>b</sup> |
| 0 ft/m to 3 ft                 | Unprotected Noncombustible (U.P. NB) | Not Permitted              |
|                                | Unprotected Steel Deck (U.S.D)       | 10%                        |
|                                | Protected <sup>c</sup>               | 10%                        |
| 3 ft to 6 ft                   | Unprotected Noncombustible (U.P. NB) | 10%                        |
|                                | Unprotected Steel Deck (U.S.D)       | 25%                        |
|                                | Protected <sup>c</sup>               | 25%                        |
| 6 ft to 10 ft                  | Unprotected Noncombustible (U.P. NB) | 10%                        |
|                                | Unprotected Steel Deck (U.S.D)       | 40%                        |
|                                | Protected <sup>c</sup>               | 40%                        |
| 10 ft to 15 ft                 | Unprotected Noncombustible (U.P. NB) | 10%                        |
|                                | Unprotected Steel Deck (U.S.D)       | 55%                        |
|                                | Protected <sup>c</sup>               | 55%                        |
| 15 ft to 20 ft                 | Unprotected Noncombustible (U.P. NB) | 10%                        |
|                                | Unprotected Steel Deck (U.S.D)       | 70%                        |
|                                | Protected <sup>c</sup>               | 70%                        |
| 20 ft to 30 ft                 | Unprotected Noncombustible (U.P. NB) | 10%                        |
|                                | Unprotected Steel Deck (U.S.D)       | 85%                        |
|                                | Protected <sup>c</sup>               | 85%                        |
| 30 ft or greater               | Unprotected Noncombustible (U.P. NB) | 10%                        |
|                                | Unprotected Steel Deck (U.S.D)       | 100%                       |
|                                | Protected <sup>c</sup>               | 100%                       |

\*As a percentage of the exterior wall area. The maximum area of any one opening shall not exceed 100 sq ft (9.3 m<sup>2</sup>).  
 \*\*If the exterior opening is protected with a fire-rated assembly that meets the requirements of Section 705.5.5, the area shall be limited to 10% of the exterior wall area.  
 \*\*\*If the exterior opening is protected with a fire-rated assembly that meets the requirements of Section 705.5.5 and is protected with a fire-rated assembly that meets the requirements of Section 705.5.5.1, the area shall be limited to 10% of the exterior wall area.  
 \*\*\*\*If the exterior opening is protected with a fire-rated assembly that meets the requirements of Section 705.5.5 and is protected with a fire-rated assembly that meets the requirements of Section 705.5.5.1 and is protected with a fire-rated assembly that meets the requirements of Section 705.5.5.2, the area shall be limited to 10% of the exterior wall area.  
 \*\*\*\*\*If the exterior opening is protected with a fire-rated assembly that meets the requirements of Section 705.5.5 and is protected with a fire-rated assembly that meets the requirements of Section 705.5.5.1 and is protected with a fire-rated assembly that meets the requirements of Section 705.5.5.2 and is protected with a fire-rated assembly that meets the requirements of Section 705.5.5.3, the area shall be limited to 10% of the exterior wall area.

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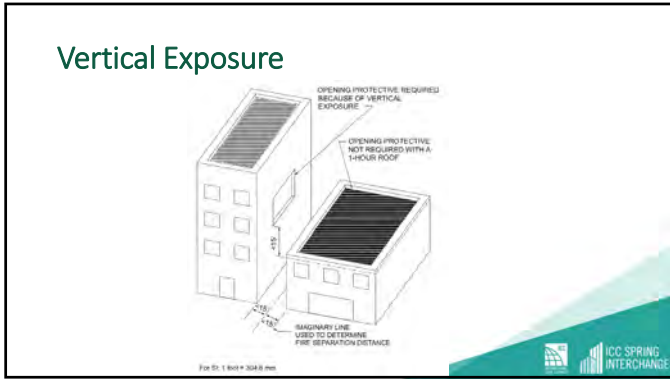
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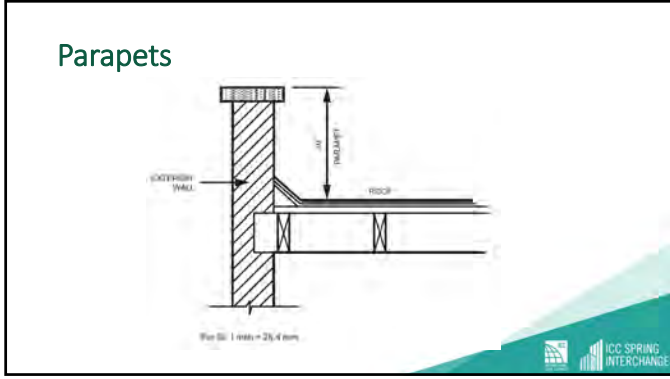
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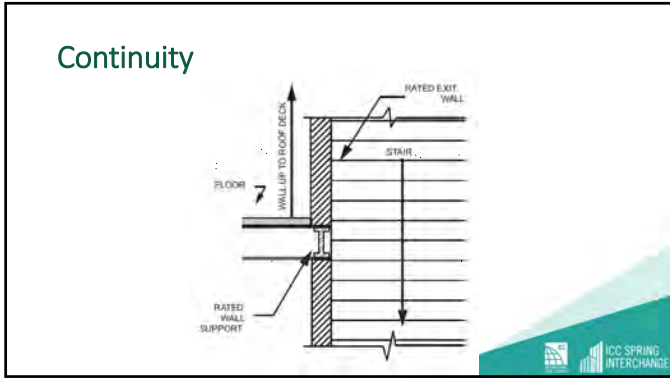
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### Check Fire Partitions

Five Steps

1. Check dwelling unit and sleeping unit separations.
2. Check tenant separations in covered and open mall buildings.
3. Check exit access corridors.
4. Check elevator lobbies.
5. Check egress balconies.



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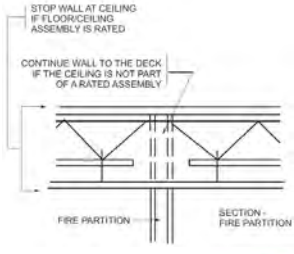

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### Continuity of Fire Partitions

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### Check Smoke Barriers

Eight Steps:

1. Check underground buildings.
2. Check Group I-1, condition 2, I-2 and I-3 occupancies.
3. Check ambulatory care facilities.
4. Check smoke control.
5. Check areas of refuge.
6. Check fire service access elevator and occupant evacuation elevator lobbies.
7. Check fire-resistance rating.
8. Check continuity.



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### Check Smoke Partitions

Five Steps:

1. Check Group I-2 occupancies.
2. Check elevator lobby enclosure.
3. Check fire-resistance rating.
4. Check continuity.
5. Check openings.



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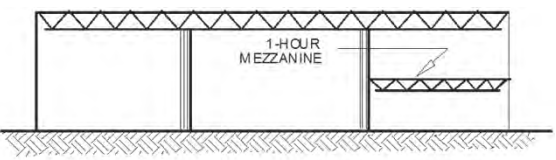
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### Floor Construction



SECTION — TYPE II BUILDING



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### Check Roof Construction

Two Steps:

1. Determine the fire-resistance rating for roofs as required by Table 601.
2. Check the use of combustible materials in roofs of Type I or II construction.



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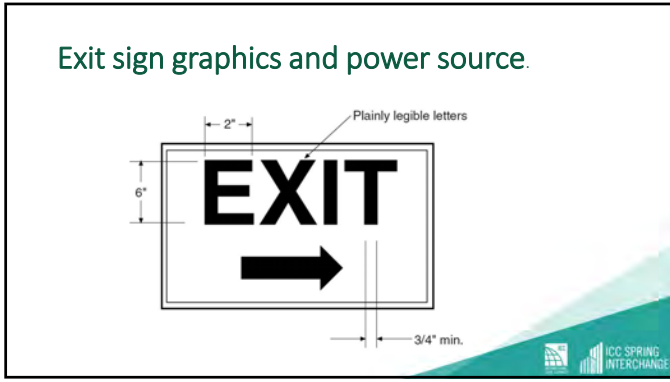
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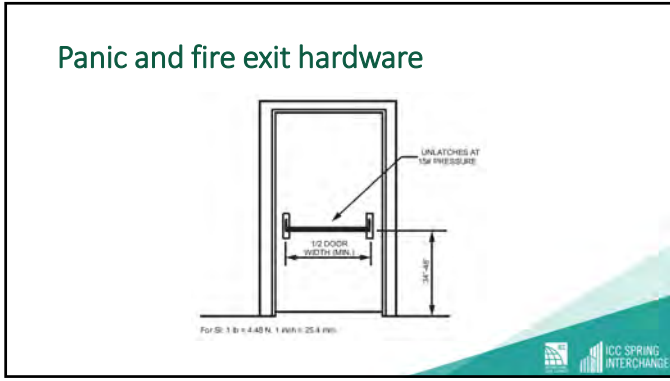
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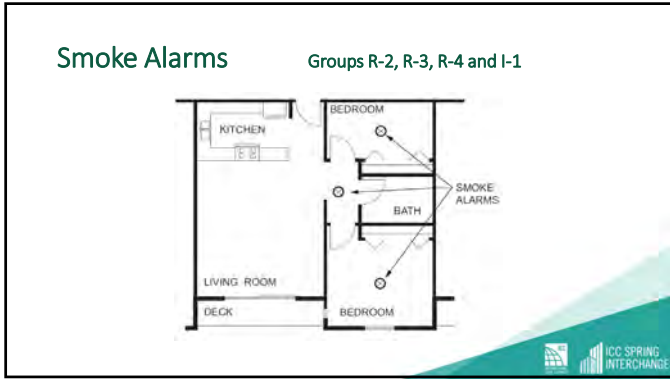
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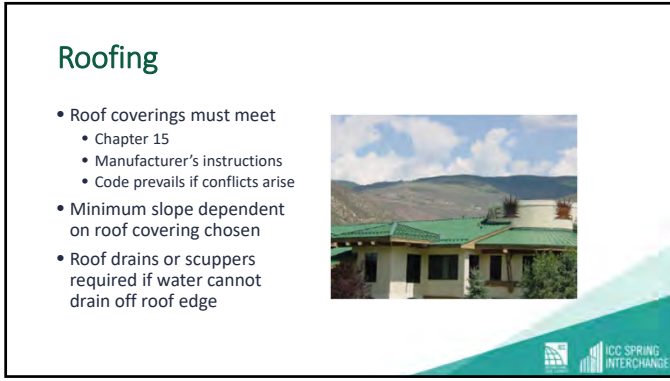
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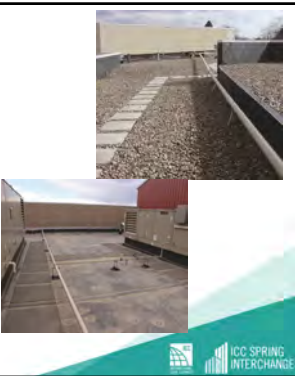

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### Low-slope Roofs

- Slope can be as low as ¼:12
- Roof covering systems
  - Built-up
    - Asphalt
    - Coal tar pitch
  - Modified bitumen
  - Thermoset single-ply roof covering (EPDM)
  - Thermoplastic single-ply roof covering (PVC, TPO, CSPE)

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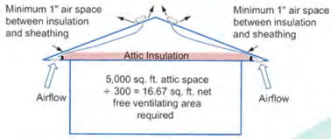

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### Moisture Control in Attics

- Net free area of attic vents
  - $\geq 1/150$  attic area
  - $\geq 1/300$  when
    - 40–50% of openings in top 3' of attic
    - Remainder at eave or cornice vents
  - $\geq 1/300$  with Class I or II vapor barrier

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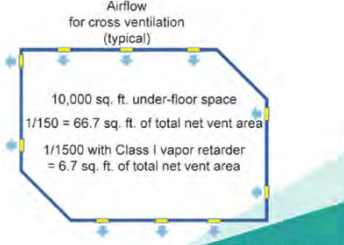

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### Under-floor Ventilation

- Ratio of 1 ft<sup>2</sup> of opening for 150 ft<sup>2</sup> of under-floor space
- Class I vapor retarder
  - Ratio of 1 ft<sup>2</sup> of opening for 1,500 ft<sup>2</sup> of under-floor space

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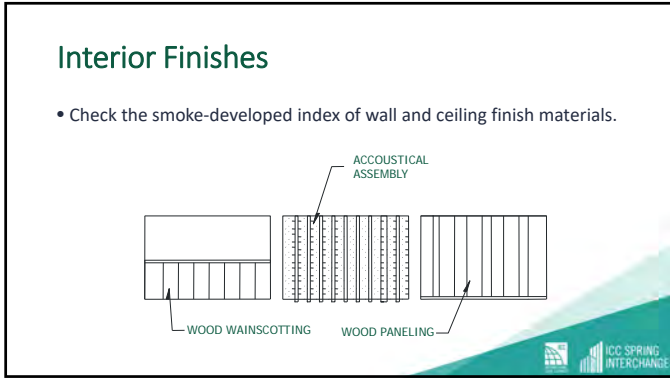
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### Table 803.13

TABLE 803.13  
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY\*

| GROUP         | SPRINKLERED <sup>b</sup>  |  |   | NOSPINKLERED  |  |   |
|---------------|---|--|---|---|--|---|
|               | Interior wall coverings and tapes and egg porosity <sup>a,1</sup> | Conditions and enclosures for exit access stairways and ramps <sup>2</sup> | Routes and enclosed spaces <sup>2</sup> | Interior wall coverings and tapes and egg porosity <sup>a,1</sup> | Conditions and enclosures for exit access stairways and ramps <sup>2</sup> | Routes and enclosed spaces <sup>2</sup> |
| M, E, A-2     | B   | B  | C                                       | A   | A <sup>1</sup>   | B <sup>1</sup>                          |
| A-3, A-4, A-5 | B   | B  | C                                       | A   | A <sup>1</sup>   | C                                       |
| R, E, M, R-1  | B   | C <sup>1</sup>   | C                                       | A   | B  | C                                       |
| R-4           | B   | C  | C                                       | A   | B  | B                                       |
| F             | C   | C  | C                                       | B   | C  | C                                       |
| H             | B   | B  | C <sup>1</sup>                          | A   | A  | B                                       |
| I-1           | B   | C  | C                                       | A   | B  | B                                       |
| I-2           | B   | B  | B <sup>1,2</sup>                        | A   | A  | B                                       |
| I-3           | A   | A <sup>1</sup>   | C                                       | A   | A  | B                                       |
| I-4           | B   | B  | B <sup>1,2</sup>                        | A   | A  | B                                       |
| U-2           | C   | C  | C                                       | B   | B  | C                                       |
| U-3           | C   | C  | C                                       | C   | C  | C                                       |
| S             | C   | C  | C                                       | B   | B  | C                                       |

a. No restrictions.  
b. No restrictions.

FIG. 50. 1 inch = 25.4 mm, 1 square foot = 0.0929 m<sup>2</sup>.



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### Course Summary

- This course has provided you some concepts for evaluating your approaches to performing a nonstructural plan review.
- Encouraging the development of a systematic approach which:
  - Tailors the plan review approach to reflect community expectations
  - Maintains consistency in plan reviews
  - Quickly identifies code deficiencies in submittal information that require significant design resolutions



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**#ICCSpringInterchange**



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