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## 2021 IBC Occupancy Classification and Mixed Occupancies

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## Introduction

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### Course Description

- This seminar addresses the key issues of the 2021 *International Building Code*® (IBC®) regarding the proper classification of buildings based on use.
- In addition, the application of mixed-occupancy conditions will be discussed.

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## Goal

- Participants will be able to:
  - Assign the appropriate occupancy classification(s) based on Chapter 3, and
  - Apply the mixed occupancy provisions of Section 508.



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## Objectives

Upon completion, participants will be better able to:

1. Identify and describe the 26 specific occupancy groups established in the 2021 IBC.
2. Determine how to apply the mixed-occupancy process for accessory occupancies, nonseparated occupancies and separated occupancies.
3. Understand how the mixed-occupancy provisions relate to the requirements for allowable building size and required fire protection features.



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## Occupancy Classification

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## Occupancy Classification—Introduction

- Everything starts with the correct occupancy classification!
- Good decisions in the occupancy classification process provide the groundwork for the proper application of many other important code provisions.

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## Occupancy Classification—Introduction

Evaluate the building for use and occupancy:

- How the space will be used.
- The abilities of the occupants to respond in an emergency.
- Specific requirements (levels of safety) related to the various occupancy groups.

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## Occupancy Classification—General Requirements Section 302.1

Occupancy Groups

- Structures are to be classified into one or more of the occupancy classifications established in the code.
- The 10 general types are further subdivided into 26 specific occupancies.
  - In addition, three of the specific occupancies are further subdivided into Conditions 1 and 2

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## Occupancy Classification—General Requirements Section 302.1

- Where a room or space is to be occupied for different types of uses at different times, all of the requirements applicable to each of the uses must be considered.
- Those buildings that contain two or more distinct occupancy classifications must comply with the provisions of Section 508 for mixed-occupancy buildings.



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## Use vs. Occupancy

- "Use" and "Occupancy" are terms that differ in meaning and application within the IBC.
- "Use" describes the activity that occurs within the space, room or building.
  - "Use" is seldom utilized in the IBC as the scoping mechanism.
  - Examples include occupant load calculation and incidental uses.
- "Occupancy" describes the specific classification a "use" is assigned when applying the code to a space, room or building.
  - Almost all code provisions with application to a limited number of situations are regulated by "Occupancy".
  - Primary examples include allowable height and area, fire protection features and means of egress requirements.



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## Use vs. Occupancy

- Multiple uses do not necessarily create multiple occupancies.
- General occupancy classification is intended to include related support areas such as corridors, stairways, restrooms, mechanical equipment rooms, small storage areas, etc.



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## Occupancy Classification—General Requirements Section 302.1

- When in doubt, it is important that an occupancy classification be assigned that most nearly resembles those occupancies with similar fire safety and life safety risks.



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## Occupancy Classification

- Occupant-related Hazards
  - Number of occupants.
  - Density of the occupants.
  - Age of the occupants.
  - Mobility of the occupants.
  - Awareness of the occupants.



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## Occupancy Classification

- Content-related Hazards
  - Density of contents.
  - Quantity of contents.
  - Type of contents.
  - Environment of contents.
  - Combustibility/Flammability of contents.



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## Occupancy Classification — General Requirements Section 302.1

| Types of Use | General Occupancy Group | Occupancy Sub-Groups |
|---|---|---|
| Assembly | Group A | A-1, A-2, A-3, A-4, A-5 |
| Business | Group B | None |
| Educational | Group E | None |
| Factory / Industrial | Group F | F-1, F-2 |
| High Hazard | Group H | H-1, H-2, H-3, H-4, H-5 |
| Institutional | Group I | I-1, I-2, I-3, I-4 |
| Mercantile | Group M | None |
| Residential | Group R | R-1, R-2, R-3. R-4 |
| Storage | Group S | S-1, S-2 |
| Utility | Group U | None |



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## Occupancy Classification—Assembly Group A Section 303.1

Assembly Group A occupancies include buildings or portions of buildings where persons (usually 50 or more) gather for:

- Civic, social or religious functions.
- Recreation.
- Food and/or drink consumption.
- Awaiting transportation.
- Similar activities.



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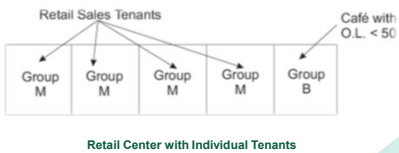
## Occupancy Classification—Assembly Section 303.1.1

**Small buildings and tenant spaces:** Buildings or tenant spaces with an occupant load of 49 or less. The building or space is a stand-alone use and is not accessory to any other occupancy. The classification of Group B is appropriate.




Retail Center with Individual Tenants



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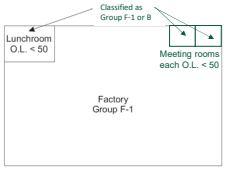
## Occupancy Classification—Assembly Section 303.1.2, #1

**Small assembly spaces:** A room with an occupant load less than 50 and accessory to another occupancy is to be classified either as a part of that occupancy or as Group B.




**Example of small lunchrooms and meeting rooms in a manufacturing facility**

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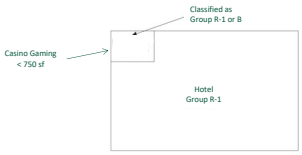
## Occupancy Classification—Assembly Section 303.1.2, #2

**Small assembly spaces:** Similar to Item #1, a room or space with a floor area of less than 750 square feet and accessory to another occupancy is to be classified as a part of that occupancy or as Group B.




**Casino Gaming Area Associated with a Hotel**

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## Occupancy Classification—Assembly

Spaces in Group A fall into two basic groups:

- Those assembly uses that occur within a building (Groups A-1, A-2, A-3 and A-4).
- Those assembly uses that occur in structures primarily open to the exterior (Group A-5).

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## Occupancy Classification—Assembly Section 303.2

**Group A-1**

| Characteristics | Examples |
|---|---|
| ▪ High occupant density<br>▪ Usually fixed seating | ▪ Motion picture theaters<br>▪ Symphony/concert halls |
| ▪ Foyers/lobbies | ▪ Television/radio studios |
| ▪ Stages, platforms or projection screen<br>▪ Low-light conditions<br>▪ Sizable occupant loads | ▪ Performance theaters |

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## Occupancy Classification—Assembly Section 303.3

**Group A-2**

| Characteristics | Examples |
|---|---|
| ▪ Consumption of food and/or drink (primary characteristic) | ▪ Banquet halls<br>▪ Night clubs |
| ▪ Moderate occupant density<br>▪ Variable lighting levels<br>▪ Aisles not clearly defined<br>▪ Movable furnishings | ▪ Restaurants<br>▪ Taverns and bars<br>▪ Casino gaming areas |

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## Occupancy Classification—Assembly Section 303.4

**Group A-3**

| Characteristics | Examples |
|---|---|
| ▪ Moderate occupant density | ▪ Art galleries<br>▪ Exhibition halls |
| ▪ Adequate lighting levels | ▪ Libraries<br>▪ Museums |
| ▪ Moderate fire loading | ▪ Places of religious worship |

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## Occupancy Classification—Assembly

- Group A-3 is the default classification for assembly occupancies.
- If an assembly use cannot obviously be classified as one of the four other indoor Group A classifications, then it should be considered as a Group A-3 occupancy.



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## Occupancy Classification—Assembly Section 303.5

**Group A-4**

| Characteristics | Examples |
|---|---|
| ▪ Lighting levels can fluctuate<br>▪ Some food or drink consumption<br>▪ Spectator seating typically fixed<br>▪ Medium to high density | ▪ Arenas<br>▪ Skating rinks<br>▪ Gymnasiums |



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## Occupancy Classification—Assembly Section 303.6

**Group A-5**

| Characteristics | Examples |
|---|---|
| ▪ No enclosure to contain smoke, although spectator might be protected from rain and sun | ▪ Amusement park structures<br>▪ Bleachers and reviewing stands |
| ▪ Limited or no conditioned air | ▪ Grandstands |
| ▪ Most seating is fixed | ▪ Stadiums |



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## Occupancy Classification—Business Section 304.1

**Group B**

**Characteristics**

- Many occupants are familiar with the premises
- Most occupants are adults capable of recognizing and effectively responding to "emergency situations"
- Moderate fire load

**Examples**

- Ambulatory care facilities
- Banks
- Barber/beauty shops
- Office areas
- Outpatient clinics
- Post offices
- Training and skill development

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## Occupancy Classification—Educational Sections 305.1, 305.2

**Group E**

**Characteristics**

- Six or more occupants at a time
- Students younger than college age
- 2½ years to the 12th grade is the general default age for this classification

**Examples**

- High schools (through 12th grade)
- Middle schools
- Elementary schools
- Preschools
- Day care facilities (more than 5 children, older than 2½ years)

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## Occupancy Classification—Educational Section 308.5.1

- **Classification as Group E:** A child care facility housing infants and toddlers is classified as Group E, rather that Group I-4, where:
  - More than 5, but no more than 100, children are 2½ years of age or less.
  - Rooms where such infants/toddlers are cared for are located on level of exit discharge.
  - Each of these infant/toddler care rooms has an exit door directly to the outside.

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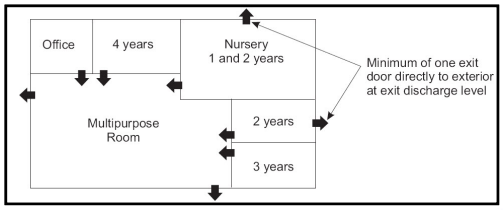
## Occupancy Classification—Educational




**Group E—Day Care Facility**



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## Occupancy Classification—Factory/Industrial Section 306.1

Group F occupancies are facilities where manufacturing operations and similar industrial activities occur, other than those classified as Group H. Operations may include assembling, fabricating, finishing, manufacturing, packaging, repair or processing work.

- F-1: where combustible materials are used in the operations.
- F-2: where all of the materials are noncombustible.



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## Occupancy Classification—Factory/Industrial Section 306.2

### Group F-1 Moderate-Hazard Factory

| Characteristics | Examples |
|---|---|
| ▪ All Group F operations that are not considered Group F-2 | ▪ Aircraft, automobile, appliance and machine manufacturers<br>▪ Water/sewer treatment |
| ▪ Production, assembling, finishing, packaging or repair of combustible products | ▪ Clothing manufacturers<br>▪ Furniture makers<br>▪ Woodworking shops |



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## Occupancy Classification—Factory/Industrial Section 306.3

**Group F-2 Low-Hazard Factory**

**Characteristics**

- Similar to Group F-1, but no combustibles other than limited amounts in finishing, packing or processing operations

**Examples**

- Ceramic products
- Glass products
- Masonry manufacturing
- Metal fabrication plant



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## Occupancy Classification—High Hazard Section 307.1

**Group H occupancies:**

- Involve the manufacturing, processing, generation or storage of materials that constitute a physical and/or health hazard.
- Quantities of such hazardous materials exceed those permitted within control areas as regulated by Section 414.2, based on Tables 307.1(1) and/or 307.1(2).



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## Occupancy Classification—High Hazard Section 307.1.1

**Conditions not considered as Group H:** There are 19 conditions where a classification of Group H is not to be assigned, but rather the occupancy it most nearly resembles.



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## Occupancy Classification—High Hazard Section 307.1.1

**Conditions not considered as Group H include:**

- Application of flammable finishes in conformance with Section 416 of the IFC and the IBC.
- Sales and storage of flammable and combustible liquids in Group M occupancies if compliant with the IFC.
- Refrigeration systems.
- Agricultural materials only stored or utilized on the premises.
- Distilling or brewing of beverages conforming to requirements of the IFC.

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## Occupancy Classification

- Refer to Section 307.1 and Tables 307.1(1) and 307.1(2) to determine if buildings, structures or materials are exempt from the Group H classification.
- In accordance with Section 307.2, the design of high-hazard buildings must conform to additional requirements in the IFC and Section 414 of the IBC.

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## Occupancy Classification—High Hazard Tables 307.1(1), 307.1(2)

- Use Table 307.1(1) for the maximum allowable quantities of materials posing a physical hazard.
- Use Table 307.1(2) for materials posing a health hazard.

If the quantity of hazardous materials does not exceed the calculated amount, then the use is not considered a Group H occupancy.

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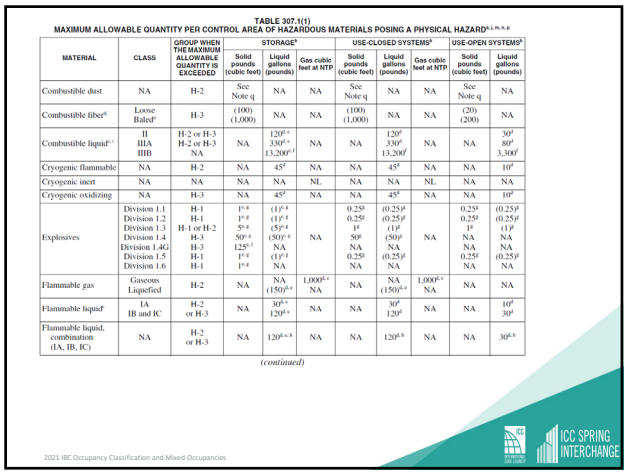

**TABLE 307.1(1)**
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, i, m, n, p]**

| MATERIAL | CLASS | GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED | STORAGE[b] | | | USE-CLOSED SYSTEMS[b] | | | USE-OPEN SYSTEMS[b] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Solid pounds (cubic feet) | Liquid gallons (pounds) | Gas cubic feet at NTP | Solid pounds (cubic feet) | Liquid gallons (pounds) | Gas cubic feet at NTP | Solid pounds (cubic feet) | Liquid gallons (pounds) |
| Combustible dust | NA | H-2 | See Note q | NA | NA | See Note q | NA | NA | See Note q | NA |
| Combustible fiber[q] | Loose Baled[o] | H-3 | (100) (1,000) | NA | NA | (100) (1,000) | NA | NA | (20) (200) | NA |
| Combustible liquid[c, j] | II<br>IIIA<br>IIIB | H-2 or H-3<br>H-2 or H-3<br>NA | NA | 120[d, e]<br>330[d, e]<br>13,200[e, f] | NA | NA | 120[d]<br>330[d]<br>13,200[f] | NA | NA | 30[d]<br>80[d]<br>3,300[f] |
| Cryogenic flammable | NA | H-2 | NA | 45[d] | NA | NA | 45[d] | NA | NA | 10[d] |
| Cryogenic inert | NA | NA | NA | NA | NL | NA | NA | NL | NA | NA |
| Cryogenic oxidizing | NA | H-3 | NA | 45[d] | NA | NA | 45[d] | NA | NA | 10[d] |
| Explosives | Division 1.1<br>Division 1.2<br>Division 1.3<br>Division 1.4<br>Division 1.4G<br>Division 1.5<br>Division 1.6 | H-1<br>H-1<br>H-1 or H-2<br>H-3<br>H-3<br>H-1<br>H-1 | 1[e, g]<br>1[e, g]<br>5[e, g]<br>50[e, g]<br>125[e, l]<br>1[e, g]<br>1[e, g] | (1)[e, g]<br>(1)[e, g]<br>(5)[e, g]<br>(50)[e, g]<br>NA<br>(1)[e, g]<br>NA | NA | 0.25[g]<br>0.25[g]<br>1[g]<br>50[g]<br>NA<br>0.25[g]<br>NA | (0.25)[g]<br>(0.25)[g]<br>(1)[g]<br>(50)[g]<br>NA<br>(0.25)[g]<br>NA | NA | 0.25[g]<br>0.25[g]<br>1[g]<br>NA<br>NA<br>0.25[g]<br>NA | (0.25)[g]<br>(0.25)[g]<br>(1)[g]<br>NA<br>NA<br>(0.25)[g]<br>NA |
| Flammable gas | Gaseous Liquefied | H-2 | NA | NA (150)[d, e] | 1,000[d, e]<br>NA | NA | NA (150)[d, e] | 1,000[d, e]<br>NA | NA | NA |
| Flammable liquid[c] | IA<br>IB and IC | H-2 or H-3 | NA | 30[d, e]<br>120[d, e] | NA | NA | 30[d]<br>120[d] | NA | NA | 10[d]<br>30[d] |
| Flammable liquid, combination (IA, IB, IC) | NA | H-2 or H-3 | NA | 120[d, e, h] | NA | NA | 120[d, h] | NA | NA | 30[d, h] |

*(continued)*



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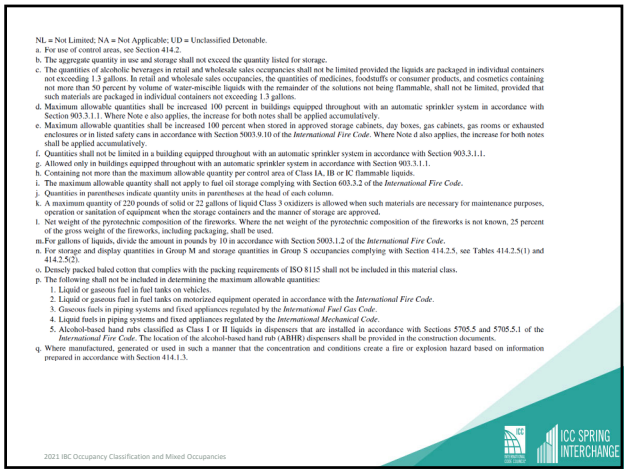

NL = Not Limited; NA = Not Applicable; UD = Unclassified Detonable.

a. For use of control areas, see Section 414.2.
b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.
c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited provided the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.
d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.
e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10 of the *International Fire Code*. Where Note d also applies, the increase for both notes shall be applied accumulatively.
f. Quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
g. Allowed only in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
h. Containing not more than the maximum allowable quantity per control area of Class IA, IB or IC flammable liquids.
i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 603.3.2 of the *International Fire Code*.
j. Quantities in parentheses indicate quantity units in parentheses at the head of each column.
k. A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment when the storage containers and the manner of storage are approved.
l. Net weight of the pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks, including packaging, shall be used.
m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the *International Fire Code*.
n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).
o. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
p. The following shall not be included in determining the maximum allowable quantities:
   1. Liquid or gaseous fuel in fuel tanks on vehicles.
   2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with the *International Fire Code*.
   3. Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.
   4. Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.
   5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1 of the *International Fire Code*. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.
q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.



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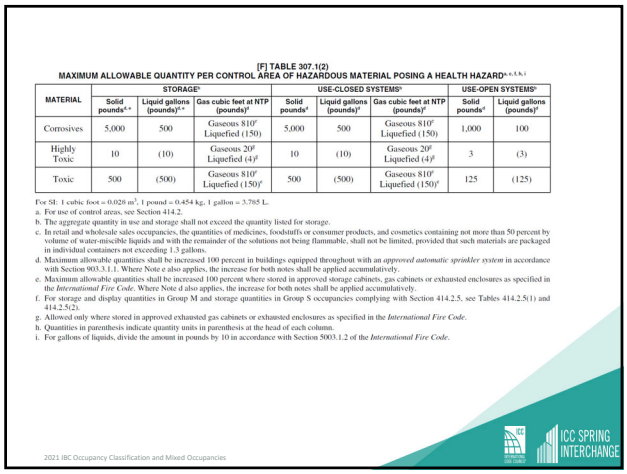

**[F] TABLE 307.1(2)**
**MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL POSING A HEALTH HAZARD[a, c, f, h, i]**

| MATERIAL | STORAGE[b] | | | USE-CLOSED SYSTEMS[b] | | | USE-OPEN SYSTEMS[b] | |
|---|---|---|---|---|---|---|---|---|
| | Solid pounds[d, e] | Liquid gallons (pounds)[d, e] | Gas cubic feet at NTP (pounds)[f] | Solid pounds[d] | Liquid gallons (pounds)[f] | Gas cubic feet at NTP (pounds)[f] | Solid pounds[d] | Liquid gallons (pounds)[f] |
| Corrosives | 5,000 | 500 | Gaseous 810[g]<br>Liquefied (150) | 5,000 | 500 | Gaseous 810[g]<br>Liquefied (150) | 1,000 | 100 |
| Highly Toxic | 10 | (10) | Gaseous 20[g]<br>Liquefied (4)[g] | 10 | (10) | Gaseous 20[g]<br>Liquefied (4)[g] | 3 | (3) |
| Toxic | 500 | (500) | Gaseous 810[g]<br>Liquefied (150)[g] | 500 | (500) | Gaseous 810[g]<br>Liquefied (150)[g] | 125 | (125) |

For SI: 1 cubic foot = 0.026 m$^3$, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

a. For use of control areas, see Section 414.2.
b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.
c. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.
d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.
e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, gas cabinets or exhausted enclosures as specified in the *International Fire Code*. Where Note d also applies, the increase for both notes shall be applied accumulatively.
f. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).
g. Allowed only where stored in approved exhausted gas cabinets or exhausted enclosures as specified in the *International Fire Code*.
h. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.
i. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the *International Fire Code*.



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## Occupancy Classification—High Hazard Section 414.2

**Control Areas**

If the amount of hazardous materials exceeds that provided by Table 307.1(1) or 307.1(2), it is still possible that a Group H occupancy does not exist.

Additional quantities are permitted in non-Group H buildings if they are properly distributed in control areas complying with Section 414.2.



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## Occupancy Classification—Laboratory Suites Section 428

A similar approach to the regulation of hazardous materials is established in Section 428 regarding laboratory suites.

TABLE [F] 428.3
DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR

| FLOOR LEVEL | | PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE[a] | NUMBER OF LAB SUITES PER FLOOR | FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b] |
|---|---|---|---|---|
| Above Grade Plane | 21+ | Not allowed | Not Permitted | Not Permitted |
| | 16-20 | 25 | 1 | 2[c] |
| | 11-15 | 50 | 1 | 2[c] |
| | 7-10 | 50 | 2 | 2[c] |
| | 4-6 | 75 | 4 | 1 |
| | 3 | 100 | 4 | 1 |
| | 1-2 | 100 | 6 | 1 |
| Below Grade Plane | 1 | 75 | 4 | 1 |
| | 2 | 50 | 2 | 1 |
| | Lower than 2 | Not Allowed | Not Allowed | Not Allowed |

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 307.1(1) and 307.1(2), with all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating laboratory suites from other spaces on the same floor shall be permitted to be 1-hour fire-resistance rated.



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## Occupancy Classification—High Hazard

Where the amount of hazardous materials exceeds those permitted in complying control areas or laboratory suites, and is such that none of the conditions set forth in Section 307.1.1 are applicable, then the use is classified as a Group H occupancy.

There are 5 categories of Group H to address the hazards more directly.



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## Occupancy Classification—High Hazard

Types of Materials by Group
**Group H-1 (Section 307.3)**

- Explosives
- Detonable pyrophoric materials
- Organic peroxides, unclassified detonable
- Oxidizers, Class 4
- Unstable (reactive) materials, Class 3 detonable and Class 4

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## Occupancy Classification—High Hazard

Types of Materials by Group
**Group H-2 (Section 307.4)**

- Combustible dust
- Flammable and combustible liquids (Class I, II and IIIA) in open systems
- Cryogenic fluids, flammable
- Organic peroxides, Class I
- Flammable gases
- Oxidizers, Class 3, in open systems
- Pyrophoric materials, nondetonable
- Unstable (reactive) materials, Class 3, nondetonable
- Water-reactive materials, Class 3

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## Occupancy Classification—High Hazard

Types of Materials by Group
**Group H-3 (Section 307.5)**

- Combustible fibers
- Flammable and combustible liquids (Class I, II and IIIA) in closed systems
- Flammable solids
- Organic peroxides, Classes II and III
- Oxidizers, Class 2
- Oxidizers, Class 3, in closed systems
- Oxidizing gases
- Unstable (reactive) materials, Class 2
- Water-reactive materials, Class 2
- Cryogenic fluids, oxidizing
- Consumer fireworks, 1.4G (Class C, Common)

2021 IBC Occupancy Classification and Mixed Occupancies

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## Occupancy Classification—High Hazard

Types of Materials by Group

**Group H-4 (Section 307.6)**

- Corrosives
- Toxic materials
- Highly toxic materials

**Group H-5 (Section 307.7)**

- Semiconductor fabrication facilities and comparable research and development areas



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## Occupancy Classification—Institutional

- Group I—Characteristics
  - People are cared for or live in a supervised environment.
  - People with physical limitations because of health or age are harbored for medical treatment or other care/treatment.
  - People who are detained for penal or correctional purposes or in which the liberty of the occupants is restricted.



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## Occupancy Classification—Institutional

**Group I-1 (Section 308.2)**

**Characteristics**

- More than 16 occupants (not including staff).
- Residents—require assistance with day-to-day living tasks.
- Housed on a 24-hour basis.
- Custodial care includes persons who evacuate at a slower rate.
- Residents may have mental and psychiatric complications.

**Examples**

- Group homes
- Rehabilitation facilities
- Halfway houses
- Assisted living facilities



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## Occupancy Classification—Institutional

### Group I-1 (Section 308.2)

- Group I-1, Condition 1
  - All persons receiving custodial care are capable, without assistance, of responding to an emergency situation to complete building evacuation or relocation.
- Group I-1, Condition 2
  - Any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation or relocation.



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## Occupancy Classification—Institutional

### Group I-2 (Section 308.3)

**Characteristics**

- Used for medical care activities for six or more persons.
- Receive 24-hour care.
- May be semi-aware or semi-ambulatory, but not capable of self-preservation.

**Examples**

- Hospitals
- Detoxification facilities
- Nursing homes
- 24-hour infant/toddler care facilities (foster care facilities)



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## Occupancy Classification—Institutional

### Group I-2 (Section 308.3)

- Group I-2, Condition 1
  - Nursing homes, foster care facilities and similar uses that provide nursing and medical care but do not provide emergency care, surgery and obstetrics.
- Group I-2, Condition 2
  - Hospitals and similar facilities that provide nursing and medical care, and could also provide emergency care, surgery and obstetrics.



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## Occupancy Classification—Institutional

**Group I-3 (Section 308.4)**

**Characteristics**

- More than 5 occupants (not including staff).
- Supervised.
- Physically restricted from evacuating the building.
- Further classified into 5 occupancy conditions based on capability of free movement within facility.

**Examples**

- Detention centers
- Jails
- Prerelease centers
- Prisons



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## Occupancy Classification—Institutional

**Group I-4 (Section 308.5)**

**Characteristics**

- More than 5 occupants.
- Any age.
- Receive custodial care for less than 24 hours a day.
- Occupants incapable of self preservation.

**Examples**

- Adult care facilities
- Child care facilities



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## Occupancy Classification—Mercantile

**Group M (Section 309.1)**

**Characteristics**

- Display, sell and stock merchandise.
- If merchandise is hazardous, see Table 414.2.5(1) for quantity limits.

**Examples**

- Retail stores
- Motor fuel-dispensing facilities



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## Occupancy Classification—Residential

- Residential occupancies generally fall into two categories:
  - Transient (Group R-1)
  - Nontransient (Group R-2)
  - Transient/Nontransient (Groups R-3 and R-4)

Transient—Occupancy of a dwelling unit or sleeping unit for not more than 30 days.

- In addition, residential occupancies are regulated as dwelling units and sleeping units



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## Occupancy Classification—Residential

**Group R-1 (Section 310.2)**

**Characteristics**

- Occupants are primarily transient.
- Includes sleeping units and/or dwelling units.

**Examples**

- Hotels
- Motels
- Boarding houses (transient)*
- Bed and breakfast establishments*

* Congregate living facilities for transient occupants are classified as Group R-3 occupancies where the occupant load is 10 or less.



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## Occupancy Classification—Residential

**Group R-2 (Section 310.3)**

**Characteristics**

- Occupants are primarily permanent.
- Consists of congregate living facilities or apartment buildings (3 or more dwelling units).

**Examples**

- Apartment houses
- Dormitories*
- Fraternities and sororities*
- Monasteries and convents*

* Congregate living facilities (nontransient) with 16 or fewer occupants are classified as Group R-3 occupancies.



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## Occupancy Classification—Residential

### Group R-3 (Section 310.4)

**Characteristics**

- Occupants not transient in nature.
- Typically small occupant loads.

**Examples**

- One- and two-family dwellings outside the scope of the IRC.*
- Smaller congregate living facilities.
- Adult care and child care facilities for 5 or fewer persons for less than 24 hours.

• Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with separate means of egress are typically regulated by the IRC, so the IBC is not applicable.

2021 IBC Occupancy Classification and Mixed Occupancies

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## Occupancy Classification—Residential Section 310.4

- Group R-3 occupancies also include:
  - Care facilities providing accomodations for 5 or fewer persons receiving care,
  - Congregate living facilities (transient) with10 or fewer occupants,
  - Congregate living facilities (nontransient) with 16 or fewer occupants,
  - Lodging houses (such as bed-and-breakfasts) with 5 or fewer guest rooms and 10 or fewer occupants,
    - Owner-occupied lodging houses with 5 or fewer guest rooms and 10 or fewer total occupants permitted to be constructed per the IRC.

2021 IBC Occupancy Classification and Mixed Occupancies

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## Occupancy Classification—Residential

### Group R-4 (Section 310.5)

**Characteristics**

- Care facilities having more than 5 but not more than 16 occupants, excluding staff.

**Examples**

- Residential care facilities
- Assisted living facilities

2021 IBC Occupancy Classification and Mixed Occupancies

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## Occupancy Classification—Residential

**Group R-4 (Section 310.5)**

- Group R-4, Condition 1
  - All persons receiving custodial care are capable, without assistance, of responding to an emergency situation to complete building evacuation or relocation.
- Group R-4, Condition 2
  - Any persons receiving custodial care who require limited verbal or physical assistance while responding to an emergency situation to complete building evacuation or relocation.



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## Occupancy Classification—Residential Section 310.5

- Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided.



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## Occupancy Classification—Storage

- Group S classifications are similar to those in the Group F categories.
- Those storage occupancies classified as Group S-1 typically contain some degree of combustible materials.
- No storage of combustible materials is anticipated in Group S-2 occupancies.



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## Occupancy Classification—Storage

**Group S-1, Moderate Hazard (Section 311.2)**

**Characteristics**

- Storage of primarily combustible materials that do not qualify as hazardous materials beyond the exempt amount permitted (see Section 307).

**Examples**

- Clothing, woolen wearing apparel, silks
- Furniture storage
- Motor vehicle repair garages
- Paper products
- Tires, bulk storage



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## Occupancy Classification—Storage

**Group S-2, Low Hazard (Section 311.3)**

**Characteristics**

- Storage of noncombustibles, with a minimal amount of combustibles present such as plastic knobs, wood pallets, and some paper or cardboard boxing.

**Examples**

- Food product storage
- Glass storage
- Metal storage
- Parking garages
- Pottery storage



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## Occupancy Classification—Utility and Miscellaneous

**Group U (Section 312.1)**

**Characteristics**

- No public occupancy
- Limited or no occupant load
- Limited floor area
- Little fire hazard

**Examples**

- Agricultural buildings
- Barns
- Carports
- Tanks and towers
- Livestock shelters
- Private garages
- Stables



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## Occupancy Classification—Summary

- Once the occupancy classification(s) determination is complete, it is now possible to begin application of the remainder of the code.



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## Mixed Occupancies

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## Definition

- A mixed-occupancy condition occurs where two or more distinct occupancy classifications are determined to exist in the same building.
- Under such circumstances, the designer has available several different methodologies in Section 508 to address the mixed-occupancy building.
- Compliance with at least one of the methods is mandatory.



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## General Provisions
## Section 508.1

- Three options established in Section 508 to address mixed-occupancy buildings include:
  - Accessory Occupancies.
  - Nonseparated Occupancies.
  - Separated Occupancies.
- Methods for determining maximum allowable building size, fire protection systems, and separations are identified for each option.
- One of the three options must be applied to a mixed-occupancy condition.



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## Mixed Occupancies: Overview
## Section 508.1

- There are five key components that regulate mixed-occupancy buildings:
  - Occupancy classification.
  - Fire protection systems.
  - Allowable height.
  - Allowable area.
  - Fire-resistive separation.
- The three mixed-occupancy options differ from each other based on one or more of these five components.



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## Application of Three Options
## Section 508.1

- Section 508.1 mandates that one of the three options must be applied where a mixed occupancy exists.
  - Determination of the option depends on owner/designer decisions.
    - Building function.
    - Construction costs.
    - Design flexibility.
  - Compliance with at least one of the three options to be verified by building official.



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## Application of Options Section 508.1

- Owner/designer may choose to use more than one option within same building.
- Nonseparated occupancies: aggregate area of nonseparated occupancies evaluated as single hazard
- Separated occupancies option: relationship between multiple pairs of adjacent occupancies to be individually analyzed
- Accessory occupancies option: limit on accessory occupancies viewed on a story-by-story basis



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## Conditions Where Not Applicable Section 508.1, Exceptions

- There are two conditions under which the provisions of Section 508 do not apply:
  - Occupancies regulated under the special provisions height and area provisions of Section 510.
  - Group H-1, H-2 and H-3 occupancies where required to be in a detached building by Table 415.6.5.



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## Nonseparated Occupancies

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## Nonseparated Occupancies Overview

- "Nonseparated occupancies" method considers most restrictive requirements for fire protection and allowable height/area for occupancies involved
- This method beneficial to designer due to:
  - No requirement to separate occupancies
  - Flexibility allowed by application of "worst-case" approach to fire protection and building size.
- No requirements for a fire-resistance-rated separation between adjacent occupancies.
- Nonseparated occupancies method is most common of methods utilized.



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## Nonseparated Occupancies: Classifications Section 508.3.1

- Occupancy classification based on the general provisions of Section 302.1.
- Individually classified based on the occupancy of each individual space.



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## Nonseparated Occupancies: Fire Protection Section 508.3.1

- Most restrictive applicable provisions of Chapter 9 regulating fire-protection systems apply to the total nonseparated occupancy area, not just the specific individual occupancy, and typically address:
  - Automatic sprinkler systems.
  - Fire alarm systems.



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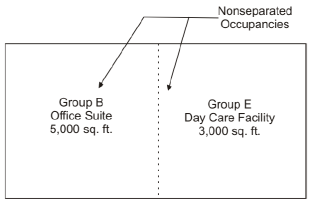
## Nonseparated Occupancies: Fire Protection Section 508.3.1

**Example**




- Manual fire alarm system required in Group E occupancy by Section 907.2.3 required throughout entire building.

2021 IBC Occupancy Classification and Mixed Occupancies

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## Nonseparated Occupancies: Allowable Area and Height – Section 508.3.2

- The maximum allowable height and area of building is based on the most restrictive allowances for the occupancy groups under consideration.
- The most restrictive allowable area is applied to the entire building.
- Same limitation is applied to the building's height.

2021 IBC Occupancy Classification and Mixed Occupancies

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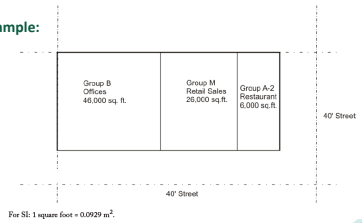
## Nonseparated Occupancies Example: Allowable Area - Section 508.3.2

- **Given:** A one-story, 78,000-square-foot, fully sprinklered building with three occupancy groups as shown. The building is of Type IIB construction and adjoins two public ways that qualify for a 50-percent frontage increase.
- **Determine:** Does the building comply with the area limitations based on nonseparated occupancies?

**Example:**




For SI: 1 square foot = 0.0929 m$^2$.

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## Nonseparated Occupancies Example: Allowable Area - Section 508.3.2

- Allowable building area to be based on the most restrictive allowances for the occupancy groups under consideration based on the building's type of construction:
  - **Group A-2: 38,000 + 4,750 = 42,750 sf**
  - Group B: 92,000 + 11,500 = 103,500 sf
  - Group M: 50,000 + 6,250 = 56,250 sf
- Therefore, the building does not comply for "nonseparated occupancies" because actual area (78,000 sf) exceeds most restrictive allowable area (42,750 sf).



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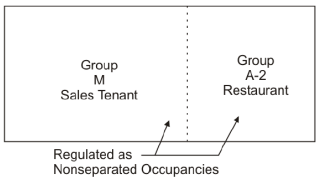
## Nonseparated Occupancies: Allowable Area and Height – Section 508.3.2

Example: Building is to be multistory, fully sprinklered and of Type VB construction. Frontage increase of 30 percent available.
1st story contains Group M and A-2 occupancies as shown with Group B occupancy above.




For SI: 1 square foot = 0.0929 m².



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## Nonseparated Occupancies: Allowable Area and Height – Section 508.3.2

| | Group M | Group A-2 | Group B |
|---|---|---|---|
| Allowable Height in Feet Above Grade Plane | **60** | **60** | **60** |
| Allowable Height in Stories Above Grade Plane | **2** | **2** | 3 |
| Allowable Building Area for Building | 63,000 sf | **42,000 sf** | 63,000 sf |
| Allowable Building Area per Story | 40,500 sf | **27,000 sf** | 40,500 sf |

**Result: In order to comply with the Nonseparated Occupancies method, the building is limited to 60 feet and 2 stories above grade plane, with a total maximum building area of 42,000 square feet and no individual story greater than 27,000 square feet.**



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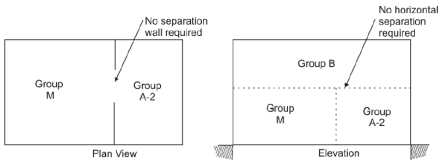
## Nonseparated Occupancies: Separations Section 508.3.3

- Application of this option will result in no physical or fire-resistance-rated separation between the nonseparated occupancies.



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## Nonseparated Occupancies Section 508.3.3, Exceptions

- Group H-2, H-3, H-4 and H-5 occupancies must be separated from all other occupancies per Section 508.4 (separated occupancies).
- Group I-1, R-1, R-2 and R-3 dwelling units and sleeping units must be separated from each other and from all other occupancies contiguous to them per Section 420.



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## Nonseparated Occupancies: A Four-Step Process

1. Determine the occupancies present in the building.
2. Apply the most restrictive fire protection requirements of Chapter 9 to the entire building.
3. Determine the maximum allowable height and area for each occupancy. Apply the most restrictive to the entire building.
4. Apply all other code requirements to each portion of the building based on the occupancy classification of that portion.



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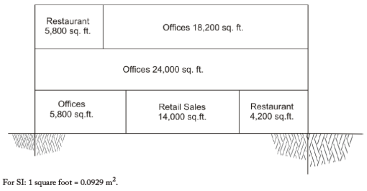
## Nonseparated Occupancies: Applying the Process

- **Given:** A three-story, Type IIB building containing assembly, business and mercantile uses. The building is fully sprinklered and does not qualify for any frontage increase for allowable area purposes. Each story is 24,000 square feet in floor area.
- **Determine:** Does the building comply with the nonseparated mixed occupancy option?




For SI: 1 square foot = 0.0929 $m^2$.



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## Nonseparated Occupancies: Applying the Process

- **Solution:**
  1. Determine the occupancies in the building.
     - Group A-2
     - Group B
     - Group M
  2. Apply the most restrictive fire protection requirements of Chapter 9 to the entire building.
     - Building to be fully sprinkered due to Group A-2 occupancy located above the level of exit discharge.
     - Building to be provided throughout with manual fire alarm system due to more than 100 persons in Group B above the level of exit discharge.



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## Nonseparated Occupancies: Applying the Process

3. Determine maximum allowable height and area for each occupancy. Apply most restrictive to the entire building.

| | Group M | Group A-2 | Group B |
|---|---|---|---|
| Allowable Height in Feet Above Grade Plane | **75** | **75** | **75** |
| Allowable Height in Stories Above Grade Plane | **3** | **3** | 4 |
| Allowable Building Area for Building | 112,500 sf | **85,500 sf** | 207,000 sf |
| Allowable Building Area per Story | 50,000 sf | **38,000 sf** | 92,000 sf |

Result: Building complies as it does not exceed 75 feet and 3 stories above grade plane, and has no more than 85,500 square feet of building area with no individual story greater than 38,000 square feet.



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## Nonseparated Occupancies: Applying the Process

4. Apply all other code requirements to each portion of the building based on the occupancy classification of that portion.
   Apply all other provisions based on the specific occupancy as applicable.



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## Separated Occupancies

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## Separated Occupancies Overview

- "Separated occupancies" method uses a balanced approach to regulating mixed occupancy conditions.
- This method is typically applied where nonseparated occupancies method is impractical, undesirable or unavailable.
- Separated occupancies method to be applied where Group H-2, H-3, H-4 and H-5 occupancies are present.
  - Group H-1 to be located in detached (single-occupancy) buildings not used for other purposes.



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## Separated Occupancies
## Section 508.4

- Separated occupancies is the only one of the three options where a fire-resistance-rated occupancy separation may be required under mixed-occupancy conditions.
- Table 508.4 is referenced to determine the degree of fire resistance that is mandated for separations.
- Separations may not be required where occupancies are considered to be of same level of hazard.



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## Separated Occupancies
## Section 508.4.1

- This approach also differs from the other options regarding fire protection requirements:
  - The fire protection requirements of Chapter 9 are to be applied individually in each portion of the building based on the occupancies in each portion, however:
  - Where nonfire-barrier-separated occupancies are permitted by Table 508.4, the most restrictive provisions of Chapter 9 that apply to the separated occupancies shall apply to the total nonfire-barrier-separated occupancy areas.



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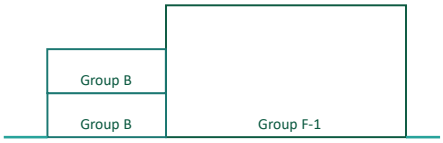
## Separated Occupancies Example
## Section 508.4.1

**EXAMPLE:**

If 2nd story of Group B occupancy has an occupant load > 100, a manual fire alarm system is required in the Group B portion of the building by Section 907.2.2, #2.




Under separated occupancies, the fire alarm system shall be:
- Extended to the Group F-1 portion of the building, OR
- A fire area separation by a minimum 3-hour fire barrier shall be provided between the Group B and the Group F-1



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## Separated Occupancies
## Sections 508.4.2, 508.4.3

- In addition, this approach differs from the other options regarding allowable height and area:
  - The allowable height for each occupancy within the building is based on Section 503.1, consistent with the method for single-occupancy buildings.
  - The allowable area of the building is based on the sum of the ratios where the actual floor area of each occupancy divided by the allowable floor area of each occupancy is not to exceed 1.0 (unity formula).

$$\frac{a_1}{A_1} + \frac{a_2}{A_2} + \frac{a_3}{A_3} + \ldots \leq 1.0$$



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## Separated Occupancies: Occupancy Classifications – Section 508.4.1

- This option requires that the occupancies be classified individually based on their specific functions.
- Requirements for means of egress, automatic sprinkler systems, fire alarm systems, plumbing facilities and all other provisions are to be applied individually to the various occupancies in the building.



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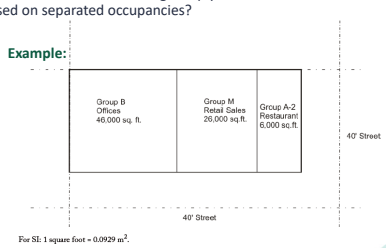
## Separated Occupancies: Allowable Area
## Section 508.4.2

- **Given:** A one-story, 78,000-square-foot, fully sprinklered building with three occupancy groups as shown. The building is of Type IIB construction and adjoins two public ways that qualify for a 50-percent frontage increase.
- **Determine:** Does the building comply with the allowable area limitations based on separated occupancies?

**Example:**




For SI: 1 square foot = 0.0929 m$^2$.



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## Separated Occupancies: Allowable Area Section 508.4.2

**Solution:** Apply the unity formula of Section 508.4.2 to determine compliance with allowable area.

| Occupancy | Actual Area | Tabular Area Table 506.2 | Allowable Area w/ Frontage Increase |
|---|---|---|---|
| Group A-2 | 6,000 | 38,000 | 42,750 |
| Group B | 46,000 | 92,000 | 103,500 |
| Group M | 26,000 | 50,000 | 56,250 |

$$A_B/A_B + A_M/A_M + A_{A\text{-}2}/A_{A\text{-}2} \leq 1.0\ ?$$

6,000/42,750 + 46,000/103,500 + 26,000/56,250 ≤ 1.0 ???

0.14 + 0.44 + 0.46 ≤ 1.0 ???

1.04 is not ≤ 1.0, therefore allowable area is exceeded.

What options are available to the designer to bring the building into compliance?



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## Separated Occupancies: Allowable Height Section 508.4.3

- Each individual occupancy in a multiple-story, mixed-occupancy building is regulated for height independently based on Section 503.1.
- Maximum number of stories for each occupancy is limited by the type of construction in Section 503.1.
  - Maximum height in feet is typically unaffected as it is most commonly based on construction type and sprinkler protection.
    - Does not vary based on occupancy classification
    - Where allowable height in feet varies among occupancies, each occupancy is also individually limited.



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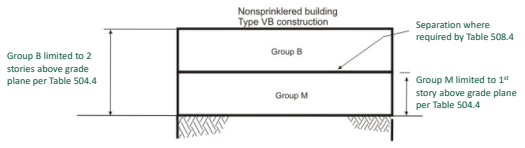
## Separated Occupancies: Allowable Height Section 508.4.3



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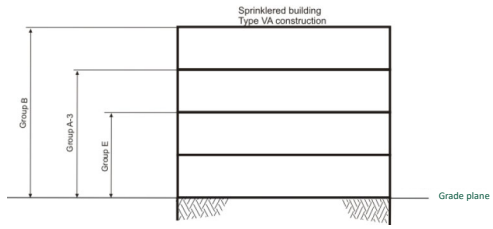
## Separated Occupancies: Allowable Height Section 508.4.3



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## Separated Occupancies: Separations Section 508.4.4

- The requirements for a fire-resistance-rated separation between adjacent occupancies vary.
- The requirements are established in Table 508.4.
- Fire barriers and horizontal assemblies are to be utilized in the complete separation of adjacent occupancies with different levels of hazard.
- Table 508.4 allows for some occupancy pairs to be adjacent with no required fire-resistive or physical separation.



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## Separated Occupancies: Separations – Section 508.4.4

REFER TO CODE BOOK

2021 IBC Table 508.4 Page 5-13

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)[f]

| OCCUPANCY | A, E | | I-1[a], I-3, I-4 | | I-2 | | R[a] | | F-2, S-2[b], U | | B[e], F-1, M,S-1 | | H-1 | | H-2 | | H-3, H-4 | | H-5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S | NS | S | NS | S | NS | S | NS | S | NS | S | NS | S | NS | S | NS | S | NS | 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[a], 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 | N | 2 | NP | 2 | NP | 2 | NP | NP | NP | 3 | NP | 2 | NP | 2 | NP |
| R[a] | 1 | 2 | 1 | NP | 2 | NP | N | N | 1[c] | 2[c] | 1 | 2 | NP | NP | 3 | NP | 2 | NP | 2 | NP |
| F-2, S-2[b], U | N | 1 | 1 | 2 | 2 | NP | 1[c] | 2[c] | N | N | 1 | 2 | NP | NP | 3 | 4 | 2 | 3 | 2 | NP |
| B[e], 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 | N | NP | NP | NP | NP | NP | NP | NP |
| H-2 | 3 | 4 | 3 | NP[c] | 3 | NP[c] | 3 | NP[c] | 3 | 4 | 2 | 3 | NP[c] | NP[c] | N | NP[c] | 1 | NP[c] | 1 | NP |
| H-3, H-4 | 2 | 3 | 2 | NP | 2 | NP | 2 | NP | 2 | 3 | 1 | 2 | NP | NP | 1 | NP | 1[d] | 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 |

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not Permitted.



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## Separated Occupancies: A Five-Step Process

1. Determine the various occupancies that occur within the building.
2. Determine the minimum required fire-resistance rating between adjacent occupancies.
3. Verify that the building does not exceed the maximum allowable area for the type of construction involved.
4. Verify that the locations of the occupancies do not exceed their maximum allowable height based on the building's type of construction.
5. Apply all other code requirements to each portion of the building based on the occupancy of that portion.



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## Separated Occupancies Practice

- **Given:** A one-story, multiple-tenant retail center containing Group A-2, A-3, B and M occupancies as shown. The 52,000-square-foot building is fully sprinklered, of Type IIB construction and has adequate frontage for a 50-percent allowable area increase.
- **Determine:** Does this building comply with Section 508.4 for separated occupancies?

Type IIB construction
Fully sprinklered, Retail Center

| | | | | |
|---|---|---|---|---|
| Group A-2 6,000 square feet | Group B 10,000 square feet | Group M 10,000 square feet | Group B 10,000 square feet | Group A-3 10,000 square feet |
| Group A-2 6,000 square feet | | | | |

For SI: 1 square foot = 0.0929 m².



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## Separated Occupancies Practice Solution

| | |
|---|---|
| **Minimum Occupancy Separation** | Since building is fully sprinklered:<br>A-2 /A-2 none required<br>A-2 /M: 1-hour<br>M/M: none required<br>M/B: none required<br>B/A-3 1-hour All OK |
| **Allowable Height** | Building is single story. OK |
| **Allowable Area** | A-2: 38,000 + 4,750 = 42,750 sf<br>A-3: 38,000 + 4,750 = 42,750 sf<br>B: 92,000 + 11,500 = 103,500 sf<br>M: 50,000 + 6,250 = 56,250 sf<br><br>12,000/42,750 + 10,000/42,750 + 10,000/103,500 + 20,000/56,250 ≤ 1<br>0.28 + 0.23 + 0.10 + 0.36 = 0.97 OK |



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# Accessory Occupancies

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## Accessory Occupancies Overview

- "Accessory occupancies" method is only applicable where support occupancies are relatively small compared to major occupancy.
- This method beneficial to designer due to:
  - No requirement to separate accessory occupancies from major occupancy.
  - In determination of allowable building area, area based on accessory occupancy as part of major occupancy.
- Accessory occupancies method has limited application.



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## Accessory Occupancies Section 508.2

- Must be subsidiary to the main occupancy of the building or to a portion of the building.
  - Examples of occupancies that may be considered as subsidiary to the main occupancy:
    - Group A-2 employee lunchroom within a Group S-1 warehouse.
    - Group A-3 training room in a Group B office building.
    - Group M showroom within a Group F-1 manufacturing building.
    - Group R-3 manager's dwelling unit within a Group S-1 self-storage facility.



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## Accessory Occupancies: Occupancy Classification – Section 508.2.1

- Must be assigned to an occupancy group established in Chapter 3 based on unique characteristics.
- The spaces of the building considered as accessory occupancies must meet all code requirements applicable to the specific to the accessory occupancy classification, not that of the main occupancy, including:
  - Means of egress requirements.
  - Fire protection requirements.



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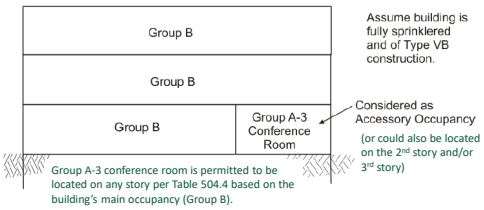
## Accessory Occupancies: Allowable Building Height - Section 508.2.2

- Allowable number of stories limited to that set forth in Section 504 for the main occupancy.



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## Accessory Occupancies: Allowable Building Area Section 508.2.3

- Allowable area of building is based on the main occupancy.
- Combined area of the main occupancy and accessory occupancy cannot exceed that permitted by Section 503.1 for the main occupancy.



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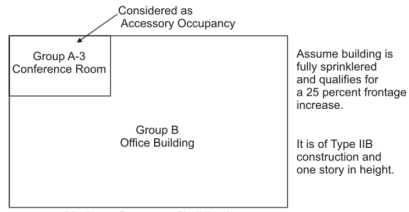
## Accessory Occupancies: Allowable Building Area Section 508.2.3




| | |
|---|---|
| 92,000 | Table 506.2 |
| 5,750 | Frontage increase |
| 97,750 | Total allowable area in square feet |



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## Accessory Occupancies: Allowable Building Area Section 508.2.3

- Limited to 10 percent of the floor area of the story located.
  - When more than one accessory occupancy is under consideration, the aggregate area of such occupancies are used to determine compliance.
- Floor area cannot exceed the tabular values for nonsprinklered buildings established by Table 506.2 for each accessory occupancy.



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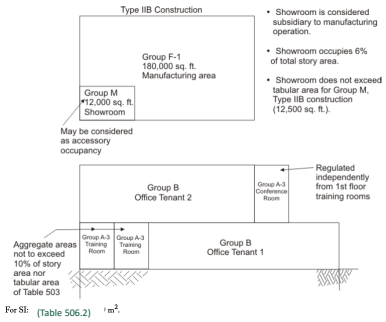
## Accessory Occupancies Examples



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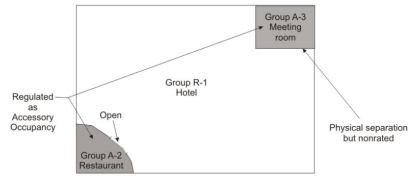
## Accessory Occupancies: Separation Section 508.2.4

- Application of the accessory occupancy option will result in no physical or fire-resistance-rated separation being mandated.



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## Accessory Occupancies: Section 508.2.4, Exceptions

- Group H-2, H-3, H-4 and H-5 occupancies to be separated from all other occupancies per Section 508.4 (separated occupancies).
- Group I-1, R-1, R-2 and R-3 dwelling units and sleeping units to be separated from each other and from accessory occupancies contiguous to them per Section 420.



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## Accessory Occupancies: A Seven-Step Process

1. Determine the various occupancy classifications that are found within the building.
2. Verify that any occupancy group under consideration as an accessory occupancy is subsidiary to the major occupancy of the building.
3. Verify that the floor area of the accessory occupancy does not exceed 10 percent of the floor area of the story in which it is located.
4. Verify that the floor area of the accessory occupancy does not exceed the tabular values for nonsprinklered buildings set forth in Table 506.2 for the building's type of construction.



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## Accessory Occupancies: A Seven-Step Process

5. Limit the building's floor area to the allowable floor area based on the allowable area for the main occupancy.
6. Limit the maximum allowable height of the accessory occupancy based on Section 504 for the main occupancy.
7. Apply all other code requirements to each portion of the building based on the individual occupancy classification of the space.



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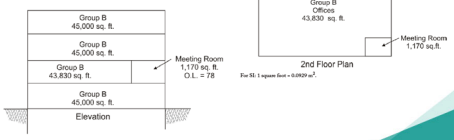
## Accessory Occupancies: Applying the Process

- **Given:** A four-story office building with a large meeting room (occupant load of 78) on the second floor. The building is fully sprinklered; is Type IIB construction and qualifies for a 75 percent frontage increase for allowable area. Each story of the building contains 45,000 square feet and the floor area of the meeting room is 1,170 square feet. It is intended that no fire-resistant occupancy separation be provided between the meeting room and the remainder of the building.
- **Determine:** Do the mixed-occupancy conditions comply with the requirements for accessory occupancies?



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## Accessory Occupancies: Applying the Process

- **Solution:**
  - Determine the various occupancy classifications that are found within the building.
    Offices: Group B
    Meeting Room: Group A-3
  - Verify that any occupancy group under consideration as an accessory occupancy is subsidiary to the occupancy of the building.
    The meeting room use is directly related to the function of the office environment.



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## Accessory Occupancies: Applying the Process

- Verify that the floor area of the accessory occupancy does not exceed 10 percent of the floor area of the story in which it is located.
  - Floor area of meeting room is 1,170 square feet, approximately 3 percent of the floor area of the 2nd story.
- Verify that the floor area of the accessory occupancy does not exceed the tabular floor area (without area increases of Section 506) set forth in Table 503 for the building's type of construction.
  - Floor area of 1,170 square feet does not exceed tabular area of 9,500 square feet for Group A-3 in Type IIB construction.



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## Accessory Occupancies: Applying the Process

- Limit the building floor area for the entire building and each individual story based on the allowable area for the main occupancy.

| | | |
|---|---|---|
| **Allowable Building Area** | | |
| Tabular area | 69,000 sf | Based on all Group B |
| Frontage increase | 17,250 sf | 75% increase |
| Total per story | 86,250 sf | |
| Total for building | 258,000 sf | 3x allowable/story |
| **Allowable Individual Story Area** | | |
| Tabular area | 92,000 sf | Based on all Group B |
| Frontage increase | 17,250 sf | 75% increase |
| Total per story | 109,250 sf | |



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## Accessory Occupancies: Applying the Process

- Limit the maximum allowable height of the accessory occupancy based on major occupancy.
  - Group A-2 occupancy permitted on 1st, 2nd, 3rd and/or 4th stories.
- Apply all other code requirements to each portion of the building based on the individual occupancy classification of the space.
  - Means of egress, fire protection and other requirements based on individual occupancies.



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## Occupancy Classification and Mixed Occupancies—Conclusion

- The determination of the appropriate occupancy classification(s) within a building is arguably the most important design/plan review determination.
- Where two or more distinct classifications have been assigned, the conditions of Section 508 for mixed-occupancy buildings must be met.



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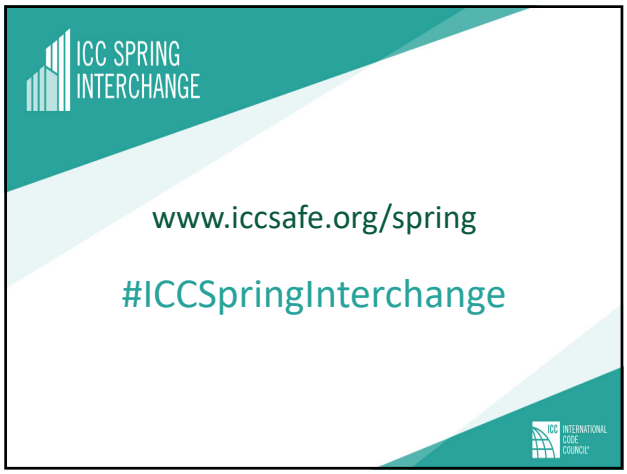
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