

## CHAPTER 34

# EXISTING STRUCTURES

### [EB] SECTION 3401 GENERAL

**3401.1 Scope.** The provisions of this chapter shall control the alteration, repair, addition and change of occupancy of existing structures.

**Exception:** Existing bleachers, grandstands and folding and telescopic seating shall comply with ICC 300-02.

**3401.2 Maintenance.** Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices or safeguards which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this subsection, the building official shall have the authority to require a building or structure to be reinspected. The requirements of this chapter shall not provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures.

**3401.3 Compliance with other codes.** Alterations, repairs, additions and changes of occupancy to existing structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy in the *International Fire Code*, *International Fuel Gas Code*, *International Plumbing Code*, *International Property Maintenance Code*, *International Private Sewage Disposal Code*, *International Mechanical Code*, *International Residential Code* and *ICC Electrical Code*.

### [EB] SECTION 3402 DEFINITIONS

**3402.1 Definitions.** The following term shall, for the purposes of this chapter and as used elsewhere in the code, have the following meaning:

**TECHNICALLY INFEASIBLE.** An alteration of a building or a facility that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

### [EB] SECTION 3403 ADDITIONS, ALTERATIONS OR REPAIRS

**3403.1 Existing buildings or structures.** Additions or alterations to any building or structure shall conform with the requirements of the code for new construction. Additions or alterations shall not be made to an existing building or structure which will cause the existing building or structure to be in violation of any provisions of this code. An existing building plus

additions shall comply with the height and area provisions of Chapter 5. Portions of the structure not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.

**Exception:** For buildings and structures in flood hazard areas established in Section 1612.3, any additions, alterations or repairs that constitute substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

**3403.2 Structural.** Additions or alterations to an existing structure shall not increase the force in any structural element by more than 5 percent, unless the increased forces on the element are still in compliance with the code for new structures, nor shall the strength of any structural element be decreased to less than that required by this code for new structures. Where repairs are made to structural elements of an existing building, and uncovered structural elements are found to be unsound or otherwise structurally deficient, such elements shall be made to conform to the requirements for new structures.

**3403.2.1 Existing live load.** Where an existing structure heretofore is altered or repaired, the minimum design loads for the structure shall be the loads applicable at the time of erection, provided that public safety is not endangered thereby.

**3403.2.2 Live load reduction.** If the approved live load is less than required by Section 1607, the areas designed for the reduced live load shall be posted in with the approved load. Placards shall be of an approved design.

**3403.3 Nonstructural.** Nonstructural alterations or repairs to an existing building or structure are permitted to be made of the same materials of which the building or structure is constructed, provided that they do not adversely affect any structural member or the fire-resistance rating of any part of the building or structure.

**3403.4 Stairways.** An alteration or the replacement of an existing stairway in an existing structure shall not be required to comply with the requirements of a new stairway as outlined in Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

### [EB] SECTION 3404 FIRE ESCAPES

**3404.1 Where permitted.** Fire escapes shall be permitted only as provided for in Sections 3404.1.1 through 3404.1.4.

**3404.1.1 New buildings.** Fire escapes shall not constitute any part of the required means of egress in new buildings.

## EXISTING STRUCTURES

**3404.1.2 Existing fire escapes.** Existing fire escapes shall be continued to be accepted as a component in the means of egress in existing buildings only.

**3404.1.3 New fire escapes.** New fire escapes for existing buildings shall be permitted only where exterior stairs cannot be utilized due to lot lines limiting stair size or due to the sidewalks, alleys or roads at grade level. New fire escapes shall not incorporate ladders or access by windows.

**3404.1.4 Limitations.** Fire escapes shall comply with this section and shall not constitute more than 50 percent of the required number of exits nor more than 50 percent of the required exit capacity.

**3404.2 Location.** Where located on the front of the building and where projecting beyond the building line, the lowest landing shall not be less than 7 feet (2134 mm) or more than 12 feet (3658 mm) above grade, and shall be equipped with a counter-balanced stairway to the street. In alleyways and thoroughfares less than 30 feet (9144 mm) wide, the clearance under the lowest landing shall not be less than 12 feet (3658 mm).

**3404.3 Construction.** The fire escape shall be designed to support a live load of 100 pounds per square foot (4788 Pa) and shall be constructed of steel or other approved noncombustible materials. Fire escapes constructed of wood not less than nominal 2 inches (51 mm) thick are permitted on buildings of Type 5 construction. Walkways and railings located over or supported by combustible roofs in buildings of Type 3 and 4 construction are permitted to be of wood not less than nominal 2 inches (51 mm) thick.

**3404.4 Dimensions.** Stairs shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm) and landings at the foot of stairs not less than 40 inches (1016 mm) wide by 36 inches (914 mm) long, located not more than 8 inches (203 mm) below the door.

**3404.5 Opening protectives.** Doors and windows along the fire escape shall be protected with 3/4-hour opening protectives.

### [EB] SECTION 3405 GLASS REPLACEMENT

**3405.1 Conformance.** The installation or replacement of glass shall be as required for new installations.

### [EB] SECTION 3406 CHANGE OF OCCUPANCY

**3406.1 Conformance.** No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancy or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancy. Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or

proposed use is less hazardous, based on life and fire risk, than the existing use.

**3406.2 Certificate of occupancy.** A certificate of occupancy shall be issued where it has been determined that the requirements for the new occupancy classification have been met.

**3406.3 Stairways.** Existing stairways in an existing structure shall not be required to comply with the requirements of a new stairway as outlined in Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

### [EB] SECTION 3407 HISTORIC BUILDINGS

**3407.1 Historic buildings.** The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy shall not be mandatory for historic buildings where such buildings are judged by the building official to not constitute a distinct life safety hazard. See the North Carolina Accessibility Code.

**3407.2 Flood hazard areas.** Within flood hazard areas established in accordance with Section 1612.3, where the work proposed constitutes substantial improvement as defined in Section 1612.2, the building shall be brought into conformance with Section 1612.

**Exception:** Historic buildings that are:

- Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or
- Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
- Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

### [EB] SECTION 3408 MOVED STRUCTURES

**3408.1 Conformance.** Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.

### [EB] SECTION 3409 ACCESSIBILITY FOR EXISTING BUILDINGS

Deleted. See the North Carolina Accessibility Code.

### [EB] SECTION 3410 COMPLIANCE ALTERNATIVES

**3410.1 Compliance.** The provisions of this section are intended to maintain or increase the current degree of public safety, health and general welfare in existing buildings while permitting repair, alteration, addition and change of occupancy without requiring full compliance with Chapters 2 through 33, or Sections 3401.3, and 3403 through 3407, except where com-

pliance with other provisions of this code is specifically required in this section.

**3410.2 Applicability.** Structures existing prior to [DATE TO BE INSERTED BY THE JURISDICTION. NOTE: IT IS RECOMMENDED THAT THIS DATE COINCIDE WITH THE EFFECTIVE DATE OF BUILDING CODES WITHIN THE JURISDICTION], in which there is work involving additions, alterations or changes of occupancy shall be made to conform to the requirements of this section or the provisions of Sections 3403 through 3407. The provisions in Sections 3410.2.1 through 3410.2.5 shall apply to existing occupancies that will continue to be, or are proposed to be, in Groups A, B, E, F, M, R, S and U. These provisions shall not apply to buildings with occupancies in Group H or I.

**3410.2.1 Change in occupancy.** Where an existing building is changed to a new occupancy classification and this section is applicable, the provisions of this section for the new occupancy shall be used to determine compliance with this code.

**3410.2.2 Partial change in occupancy.** Where a portion of the building is changed to a new occupancy classification, and that portion is separated from the remainder of the building with fire barrier wall assemblies having a fire-resistance rating as required by Table 302.3.2 for the separate occupancies, or with approved compliance alternatives, the portion changed shall be made to conform to the provisions of this section.

Where a portion of the building is changed to a new occupancy classification, and that portion is not separated from the remainder of the building with fire separation assemblies having a fire-resistance rating as required by Table 302.3.2 for the separate occupancies, or with approved compliance alternatives, the provisions of this section which apply to each occupancy shall apply to the entire building. Where there are conflicting provisions, those requirements which secure the greater public safety shall apply to the entire building or structure.

**3410.2.3 Additions.** Additions to existing buildings shall comply with the requirements of this code for new construction. The combined height and area of the existing building and the new addition shall not exceed the height and area allowed by Chapter 5. Where a fire wall that complies with Section 705 is provided between the addition and the existing building, the addition shall be considered a separate building.

**3410.2.4 Alterations and repairs.** An existing building or portion thereof, which does not comply with the requirements of this code for new construction, shall not be altered or repaired in such a manner that results in the building being less safe or sanitary than such building is currently. If, in the alteration or repair, the current level of safety or sanitation is to be reduced, the portion altered or repaired shall conform to the requirements of Chapters 2 through 12 and Chapters 14 through 33.

**3410.2.5 Accessibility requirements.** All portions of the buildings proposed for change of occupancy shall conform to the accessibility provisions of Chapter 11.

**3410.3 Acceptance.** For repairs, alterations, additions and changes of occupancy to existing buildings that are evaluated in accordance with this section, compliance with this section shall be accepted by the building official.

**3410.3.1 Hazards.** Where the building official determines that an unsafe condition exists, as provided for in Section 115, such unsafe condition shall be abated in accordance with Section 115.

**3410.3.2 Compliance with other codes.** Buildings that are evaluated in accordance with this section shall comply with the *International Fire Code* and *International Property Maintenance Code*.

**3410.4 Investigation and evaluation.** For proposed work covered by this section, the building owner shall cause the existing building to be investigated and evaluated in accordance with the provisions of this section.

**3410.4.1 Structural analysis.** The owner shall have a structural analysis of the existing building made to determine adequacy of structural systems for the proposed alteration, addition or change of occupancy. The existing building shall be capable of supporting the minimum load requirements of Chapter 16.

**3410.4.2 Submittal.** The results of the investigation and evaluation as required in Section 3410.4, along with proposed compliance alternatives, shall be submitted to the building official.

**3410.4.3 Determination of compliance.** The building official shall determine whether the existing building, with the proposed addition, alteration or change of occupancy, complies with the provisions of this section in accordance with the evaluation process in Sections 3410.5 through 3410.9.

**3410.5 Evaluation.** The evaluation shall be comprised of three categories: fire safety, means of egress and general safety, as defined in Sections 3410.5.1 through 3410.5.3.

**3410.5.1 Fire safety.** Included within the fire safety category are the structural fire resistance, automatic fire detection, fire alarm and fire suppression system features of the facility.

**3410.5.2 Means of egress.** Included within the means of egress category are the configuration, characteristics and support features for means of egress in the facility.

**3410.5.3 General safety.** Included within the general safety category are the fire safety parameters and the means of egress parameters.

**3410.6 Evaluation process.** The evaluation process specified herein shall be followed in its entirety to evaluate existing buildings. Table 3410.7 shall be utilized for tabulating the results of the evaluation. References to other sections of this code indicate that compliance with those sections is required in order to gain credit in the evaluation herein outlined. In applying this section to a building with mixed occupancies, where the separation between the mixed occupancies does not qualify for any category indicated in Section 3410.6.16, the score for each occupancy shall be determined and the lower score determined for each section of the evaluation process shall apply to the entire building.

**EXISTING STRUCTURES**

Where the separation between the mixed occupancies qualifies for any category indicated in Section 3410.6.16, the score for each occupancy shall apply to each portion of the building based on the occupancy of the space.

**3410.6.1 Building height.** The value for building height shall be the lesser value determined by the formula in Section 3410.6.1.1. Chapter 5 shall be used to determine the allowable height of the building, including allowable increases due to automatic sprinklers as provided for in Section 504.2. Subtract the actual building height from the allowable and divide by 12 1/2 feet. Enter the height value and its sign (positive or negative) in Table 3410.7 under Safety Parameter 3410.6.1, Building Height, for fire safety, means of egress and general safety. The maximum score for a building shall be 10.

**3410.6.1.1 Height formula.** The following formulas shall be used in computing the building height value.

$$\text{Height value, feet} = \frac{(AH) - (EBH)}{12.5} \times CF$$

$$\text{Height value, stories} = (AS - EBS) \times CF$$

**(Equation 34-1)**

where:

*AH* = Allowable height in feet from Table 503.

*EBH* = Existing building height in feet.

*AS* = Allowable height in stories from Table 503.

*EBS* = Existing building height in stories.

*CF* = 1 if (*AH*) - (*EBH*) is positive.

*CF* = Construction-type factor shown in Table 3410.6.6(2) if (*AH*) - (*EBH*) is negative.

**Note.** Where mixed occupancies are separated and individually evaluated as indicated in Section 3410.6, the values *AH*, *AS*, *EBH* and *EBS* shall be based on the height of the fire area of the occupancy being evaluated.

**3410.6.2 Building area.** The value for building area shall be determined by the formula in Section 3410.6.2.2. Section 503 and the formula in Section 3410.6.2.1 shall be used to determine the allowable area of the building. This shall include any allowable increases due to open perimeter and automatic sprinklers as provided for in Section 506. Subtract the actual building area from the allowable area and divide by 1,200

square feet (112 m<sup>2</sup>). Enter the area value and its sign (positive or negative) in Table 3410.7 under Safety Parameter 3410.6.2, Building Area, for fire safety, means of egress and general safety. In determining the area value, the maximum permitted positive value for area is 50 percent of the fire safety score as listed in Table 3410.8, Mandatory Safety Scores.

**3410.6.2.1 Allowable area formula.** The following formula shall be used in computing allowable area:

$$AA = \frac{(SP + OP + 100) \times (\text{area, Table 503})}{100}$$

**(Equation 34-2)**

where:

*AA* = Allowable area.

*SP* = Percent increase for sprinklers (Section 506.3).

*OP* = Percent increase for open perimeter (Section 506.2).

**3410.6.2.2 Area formula.** The following formula shall be used in computing the area value. Determine the area value for each occupancy fire area on a floor-by-floor basis. For each occupancy, choose the minimum area value of the set of values obtained for the particular occupancy.

$$\text{Area value } i = \frac{\text{Allowable area } i}{1,200 \text{ square feet}} \left[ 1 - \left( \frac{\text{Actual area } i}{\text{Allowable area } i} + \dots + \frac{\text{Actual area } n}{\text{Allowable area } n} \right) \right]$$

**(Equation 34-3)**

where:

*i* = Value for an individual separated occupancy on a floor.

*n* = Number of separated occupancies on a floor.

**3410.6.3 Compartmentation.** Evaluate the compartments created by fire barrier walls which comply with Sections 3410.6.3.1 and 3410.6.3.2 and which are exclusive of the wall elements considered under Sections 3410.6.4 and 3410.6.5. Conforming compartments shall be figured as the net area and do not include shafts, chases, stairways, walls or columns. Using Table 3410.6.3, determine the appropriate compartmentation value (*CV*) and enter that value into Table

**TABLE 3410.6.3  
COMPARTMENTATION VALUES**

OCCUPANCY	CATEGORIES <sup>a</sup>				
	a Compartment size equal to or greater than 15,000 square feet	b Compartment size of 10,000 square feet	c Compartment size of 7,500 square feet	d Compartment size of 5,000 square feet	e Compartment size of 2,500 square feet
A-1, A-3	0	6	10	14	18
A-2	0	4	10	14	18
A-4, B, E, S-2	0	5	10	15	20
F, M, R, S-1	0	4	10	16	22

For SI: 1 square foot = 0.093 m<sup>2</sup>.

a. For areas between categories, the compartmentation value shall be obtained by linear interpolation.

3410.7 under Safety Parameter 3410.6.3, Compartmentation, for fire safety, means of egress and general safety.

**3410.6.3.1 Wall construction.** A wall used to create separate compartments shall be a fire barrier conforming to Section 706 with a fire-resistance rating of not less than 2 hours. Where the building is not divided into more than one compartment, the compartment size shall be taken as the total floor area on all floors. Where there is more than one compartment within a story, each compartmented area on such story shall be provided with a horizontal exit conforming to Section 1021. The fire door serving as the horizontal exit between compartments shall be so installed, fitted and gasketed that such fire door will provide a substantial barrier to the passage of smoke.

**3410.6.3.2 Floor/ceiling construction.** A floor/ceiling assembly used to create compartments shall conform to Section 711 and shall have a fire-resistance rating of not less than 2 hours.

**3410.6.4 Tenant and dwelling unit separations.** Evaluate the fire-resistance rating of floors and walls separating tenants, including dwelling units, and not evaluated under Sections 3410.6.3 and 3410.6.5. Under the categories and occupancies in Table 3410.6.4, determine the appropriate value and enter that value in Table 3410.7 under Safety Parameter 3410.6.4, Tenant and Dwelling Unit Separation, for fire safety, means of egress and general safety.

**TABLE 3410.6.4  
SEPARATION VALUES**

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1	0	0	0	0	1
A-2	-5	-3	0	1	3
R	-4	-2	0	2	4
A-3, A-4, B, E, F, M, S-1	-4	-3	0	2	4
S-2	-5	-2	0	2	4

**3410.6.4.1 Categories.** The categories for tenant and dwelling unit separations are:

1. Category a — No fire partitions; incomplete fire partitions; no doors; doors not self-closing or automatic closing.
2. Category b — Fire partitions or floor assembly less than 1-hour fire-resistance rating or not constructed in accordance with Sections 708 or 711, respectively.
3. Category c — Fire partitions with 1 hour or greater fire-resistance rating constructed in accordance with Section 708 and floor assemblies with 1-hour but less than 2-hour fire-resistance rating constructed in accordance with Section 711, or with only one tenant within the fire area.
4. Category d — Fire barriers with 1-hour but less than 2-hour fire-resistance rating constructed in accordance with Section 706 and floor assemblies with 2-hour or greater fire-resistance rating constructed in accordance with Section 711.

5. Category e — Fire barriers and floor assemblies with 2-hour or greater fire-resistance rating and constructed in accordance with Sections 706 and 711, respectively.

**3410.6.5 Corridor walls.** Evaluate the fire-resistance rating and degree of completeness of walls which create corridors serving the floor, and constructed in accordance with Section 1016. This evaluation shall not include the wall elements considered under Sections 3410.6.3 and 3410.6.4. Under the categories and groups in Table 3410.6.5, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.5, Corridor Walls, for fire safety, means of egress and general safety.

**TABLE 3410.6.5  
CORRIDOR WALL VALUES**

OCCUPANCY	CATEGORIES			
	a	b	c <sup>a</sup>	d <sup>a</sup>
A-1	-10	-4	0	2
A-2	-30	-12	0	2
A-3, F, M, R, S-1	-7	-3	0	2
A-4, B, E, S-2	-5	-2	0	5

a. Corridors not providing at least one-half the travel distance for all occupants on a floor shall use Category b.

**3410.6.5.1 Categories.** The categories for corridor walls are:

1. Category a — No fire partitions; incomplete fire partitions; no doors; or doors not self-closing.
2. Category b — Less than 1-hour fire-resistance rating or not constructed in accordance with Section 708.4.
3. Category c — 1-hour to less than 2-hour fire-resistance rating, with doors conforming to Section 715 or without corridors as permitted by Section 1016.
4. Category d — 2-hour or greater fire-resistance rating, with doors conforming to Section 715.

**3410.6.6 Vertical openings.** Evaluate the fire-resistance rating of vertical exit enclosures, hoistways, escalator openings and other shaft enclosures within the building, and openings between two or more floors. Table 3410.6.6(1) contains the appropriate protection values. Multiply that value by the construction-type factor found in Table 3410.6.6(2). Enter the vertical opening value and its sign (positive or negative) in Table 3410.7 under Safety Parameter 3410.6.6, Vertical Openings, for fire safety, means of egress and general safety. If the structure is a one-story building, enter a value of 2. Unenclosed vertical openings that conform to the requirements of Section 707 shall not be considered in the evaluation of vertical openings.

**3410.6.6.1 Vertical opening formula.** The following formula shall be used in computing vertical opening value.

$$VO = PV \times CF \tag{Equation 34-4}$$

VO = Vertical opening value.

PV = Protection value [Table 3410.6.6(1)]  
 CF = Construction type factor [Table 3410.6.6(2)]

**TABLE 3410.6.6(1)**  
**VERTICAL OPENING PROTECTION VALUE**

PROTECTION	VALUE
None (unprotected opening)	-2 times number floors connected
Less than 1 hour	-1 times number floors connected
1 to less than 2 hours	1
2 hours or more	2

**TABLE 3410.6.6(2)**  
**CONSTRUCTION-TYPE FACTOR**

FACTOR	TYPE OF CONSTRUCTION									
	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB	
	1.2	1.5	2.2	3.5	2.5	3.5	2.3	3.3	7	

**3410.6.7 HVAC systems.** Evaluate the ability of the HVAC system to resist the movement of smoke and fire beyond the point of origin. Under the categories in Section 3410.6.7.1, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.7, HVAC Systems, for fire safety, means of egress and general safety.

**3410.6.7.1 Categories.** The categories for HVAC systems are:

1. Category a — Plenums not in accordance with Section 602 of the *International Mechanical Code*. -10 points.
2. Category b — Air movement in egress elements not in accordance with Section 1016.4. -5 points.
3. Category c — Both categories a and b are applicable. -15 points.
4. Category d — Compliance of the HVAC system with Section 1016.4 and Section 602 of the *International Mechanical Code*. 0 points.
5. Category e — Systems serving one story; or a central boiler/chiller system without ductwork connecting two or more stories. 5 points.

**3410.6.8 Automatic fire detection.** Evaluate the smoke detection capability based on the location and operation of automatic fire detectors in accordance with Section 907 and the *International Mechanical Code*. Under the categories and occupancies in Table 3410.6.8, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.8, Automatic Fire Detection, for fire safety, means of egress and general safety.

**TABLE 3410.6.8**  
**AUTOMATIC FIRE DETECTION VALUES**

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1, A-3, F, M, R, S-1	-10	-5	0	2	6
A-2	-25	-5	0	5	9
A-4, B, E, S-2	-4	-2	0	4	8

**3410.6.8.1 Categories.** The categories for automatic fire detection are:

1. Category a — None.
2. Category b — Existing smoke detectors in HVAC systems and maintained in accordance with the *International Fire Code*.
3. Category c — Smoke detectors in HVAC systems. The detectors are installed in accordance with the requirements for new buildings in the *International Mechanical Code*.
4. Category d — Smoke detectors throughout all floor areas other than individual guestrooms, tenant spaces and dwelling units.
5. Category e — Smoke detectors installed throughout the fire area.

**3410.6.9 Fire alarm systems.** Evaluate the capability of the fire alarm system in accordance with Section 907. Under the categories and occupancies in Table 3410.6.9, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.9, Fire Alarm, for fire safety, means of egress and general safety.

**TABLE 3410.6.9**  
**FIRE ALARM SYSTEM VALUES**

OCCUPANCY	CATEGORIES			
	a	b <sup>a</sup>	c	d
A-1, A-2, A-3, A-4, B, E, R	-10	-5	0	5
F, M, S	0	5	10	15

a. For buildings equipped throughout with an automatic sprinkler system, add 2 points for activation by a sprinkler water flow device.

**3410.6.9.1 Categories.** The categories for fire alarm systems are:

1. Category a — None.
2. Category b — Fire alarm system with manual fire alarm boxes in accordance with Section 907.3 and alarm notification appliances in accordance with Section 907.9.
3. Category c — Fire alarm system in accordance with Section 907.
4. Category d — Category c plus a required emergency voice/alarm communications system and a fire command station that conforms to Section 403.8 and contains the emergency voice/alarm communications system controls, fire department communication system controls and any other controls specified in Section 911 where those systems are provided.

**3410.6.10 Smoke control.** Evaluate the ability of a natural or mechanical venting, exhaust or pressurization system to control the movement of smoke from a fire. Under the categories and occupancies in Table 3410.6.10, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.10, Smoke Control, for means of egress and general safety.

**TABLE 3410.6.10  
SMOKE CONTROL VALUES**

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-2, A-3	0	1	2	3	6	6
A-4, E	0	0	0	1	3	5
B, M, R	0	2 <sup>a</sup>	3 <sup>a</sup>	3 <sup>a</sup>	3 <sup>a</sup>	4 <sup>a</sup>
F, S	0	2 <sup>a</sup>	2 <sup>a</sup>	3 <sup>a</sup>	3 <sup>a</sup>	3 <sup>a</sup>

a. This value shall be 0 if compliance with Category d or e in Section 3410.6.8.1 has not been obtained.

**3410.6.10.1 Categories.** The categories for smoke control are:

1. Category a — None.
2. Category b — The building is equipped throughout with an automatic sprinkler system. Openings are provided in exterior walls at the rate of 20 square feet (1.86 m<sup>2</sup>) per 50 linear feet (15 240 mm) of exterior wall in each story and distributed around the building perimeter at intervals not exceeding 50 feet (15 240 mm). Such openings shall be readily openable from the inside without a key or separate tool and shall be provided with ready access thereto. In lieu of operable openings, clearly and permanently marked tempered glass panels shall be used.
3. Category c — One enclosed exit stairway, with ready access thereto, from each occupied floor of the building. The stairway has operable exterior windows and the building has openings in accordance with Category b.
4. Category d — One smokeproof enclosure and the building has openings in accordance with Category b.
5. Category e — The building is equipped throughout with an automatic sprinkler system. Each fire area is provided with a mechanical air-handling system designed to accomplish smoke containment. Return and exhaust air shall be moved directly to the outside without recirculation to other fire areas of the building under fire conditions. The system shall exhaust not less than six air changes per hour from the fire area. Supply air by mechanical means to the fire area is not required. Containment of smoke shall be considered as confining smoke to the fire area involved without migration to other fire areas. Any other tested and approved design which will adequately accomplish smoke containment is permitted.
6. Category f — Each stairway shall be one of the following: a smokeproof enclosure in accordance with Section 1019.1.8; pressurized in accordance with Section 909.20.5; or shall have operable exterior windows.

**3410.6.11 Means of egress capacity and number.** Evaluate the means of egress capacity and the number of exits available to the building occupants. In applying this section,

the means of egress are required to conform to Sections 1003 through 1014 and 1016 through 1023 (except that the minimum width required by this section shall be determined solely by the width for the required capacity in accordance with Table 1005.1). The number of exits credited is the number that are available to each occupant of the area being evaluated. Existing fire escapes shall be accepted as a component in the means of egress when conforming to Section 3404. Under the categories and occupancies in Table 3410.6.11, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.11, Means of Egress Capacity, for means of egress and general safety.

**TABLE 3410.6.11  
MEANS OF EGRESS VALUES**

OCCUPANCY	CATEGORIES				
	a <sup>a</sup>	b	c	d	e
A-1, A-2, A-3, A-4, E	-10	0	2	8	10
M	-3	0	1	2	4
B, F, S	-1	0	0	0	0
R	-3	0	0	0	0

a. The values indicated are for buildings six stories or less in height. For buildings over six stories in height, add an additional -10 points.

**3410.6.11.1 Categories.** The categories for means of egress capacity and number of exits are:

1. Category a — Compliance with the minimum required means of egress capacity or number of exits is achieved through the use of a fire escape in accordance with Section 3403.
2. Category b — Capacity of the means of egress complies with Section 1004 and the number of exits complies with the minimum number required by Section 1018.
3. Category c — Capacity of the means of egress is equal to or exceeds 125 percent of the required means of egress capacity, the means of egress complies with the minimum required width dimensions specified in the code and the number of exits complies with the minimum number required by Section 1018.
4. Category d — The number of exits provided exceeds the number of exits required by Section 1018. Exits shall be located a distance apart from each other equal to not less than that specified in Section 1014.2.
5. Category e — The area being evaluated meets both Categories c and d.

**3410.6.12 Dead ends.** In spaces required to be served by more than one means of egress, evaluate the length of the exit access travel path in which the building occupants are confined to a single path of travel. Under the categories and occupancies in Table 3410.6.12, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.12, Dead Ends, for means of egress and general safety.

**TABLE 3410.6.12  
DEAD-END VALUES**

OCCUPANCY	CATEGORIES		
	a	b	c
A-1, A-3, A-4, B, E, F, M, R, S	-2	0	2
A-2, E	-2	0	2

a. For dead-end distances between categories, the dead-end value shall be obtained by linear interpolation.

**3410.6.12.1 Categories.** The categories for dead ends are:

1. Category a — Dead end of 35 feet (10 670 mm) in nonsprinklered buildings or 70 feet (21 340 mm) in sprinklered buildings.
2. Category b — Dead end of 20 feet (6096 mm); or 50 feet (15 240 mm) in Group B in accordance with Section 1016.3 exception 2.
3. Category c — No dead ends; or ratio of length to width (l/w) is less than 2.5:1.

**3410.6.13 Maximum exit access travel distance.** Evaluate the length of exit access travel to an approved exit. Determine the appropriate points in accordance with the following equation and enter that value into Table 3410.7 under Safety Parameter 3410.6.13, Maximum Exit Access Travel Distance, for means of egress and general safety. The maximum allowable exit access travel distance shall be determined in accordance with Section 1015.1.

$$\text{Points} = 20 \times \frac{\text{Maximum allowable travel distance} - \text{Maximum actual travel distance}}{\text{Max. allowable travel distance}}$$

**3410.6.14 Elevator control.** Evaluate the passenger elevator equipment and controls that are available to the fire department to reach all occupied floors. Elevator recall controls shall be provided in accordance with the *International Fire Code*. Under the categories and occupancies in Table 3410.6.14, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.14, Elevator Control, for fire safety, means of egress and general safety. The values shall be zero for a single-story building.

**TABLE 3410.6.14  
ELEVATOR CONTROL VALUES**

ELEVATOR TRAVEL	CATEGORIES			
	a	b	c	d
Less than 25 feet of travel above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-2	0	0	+2
Travel of 25 feet or more above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-4	NP	0	+4

For SI: 1 foot = 304.8 mm.

**3410.6.14.1 Categories.** The categories for elevator controls are:

1. Category a — No elevator.
2. Category b — Any elevator without Phase I and II recall.
3. Category c — All elevators with Phase I and II recall as required by the *International Fire Code*.
4. Category d — All meet Category c; or Category b where permitted to be without recall; and at least one elevator that complies with new construction requirements serves all occupied floors.

**3410.6.15 Means of egress emergency lighting.** Evaluate the presence of and reliability of means of egress emergency lighting. Under the categories and occupancies in Table 3410.6.15, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.15, Means of Egress Emergency Lighting, for means of egress and general safety.

**TABLE 3410.6.15  
MEANS OF EGRESS EMERGENCY LIGHTING VALUES**

NUMBER OF EXITS REQUIRED BY SECTION 1010	CATEGORIES		
	a	b	c
Two or more exits	NP	0	4
Minimum of one exit	0	1	1

**3410.6.15.1 Categories.** The categories for means of egress emergency lighting are:

1. Category a — Means of egress lighting and exit signs not provided with emergency power in accordance with Section 2702.
2. Category b — Means of egress lighting and exit signs provided with emergency power in accordance with Section 2702.
3. Category c — Emergency power provided to means of egress lighting and exit signs which provides protection in the event of power failure to the site or building.

**3410.6.16 Mixed occupancies.** Where a building has two or more occupancies that are not in the same occupancy classification, the separation between the mixed occupancies shall be evaluated in accordance with this section. Where there is no separation between the mixed occupancies or the separation between mixed occupancies does not qualify for any of the categories indicated in Section 3410.6.16.1, the building shall be evaluated as indicated in Section 3410.6 and the value for mixed occupancies shall be zero. Under the categories and occupancies in Table 3410.6.16, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.16, Mixed Occupancies, for fire safety and general safety. For buildings without mixed occupancies, the value shall be zero.



**TABLE 3410.6.16  
MIXED OCCUPANCY VALUES<sup>a</sup>**

OCCUPANCY	CATEGORIES		
	a	b	c
A-1, A-2, R	-10	0	10
A-3, A-4, B, E, F, M, S	-5	0	5

a. For fire-resistance ratings between categories, the value shall be obtained by linear interpolation.

**3410.6.16.1 Categories.** The categories for mixed occupancies are:

1. Category a — Minimum 1-hour fire barriers between occupancies.
2. Category b — Fire barriers between occupancies in accordance with Section 302.3.2
3. Category c — Fire barriers between occupancies having a fire-resistance rating of not less than twice that required by Section 302.3.2.

**3410.6.17 Automatic sprinklers.** Evaluate the ability to suppress a fire based on the installation of an automatic sprinkler system in accordance with Section 903.3.1.1. “Required sprinklers” shall be based on the requirements of this code. Under the categories and occupancies in Table 3410.6.17, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.17, Automatic Sprinklers, for fire safety, means of egress divided by 2 and general safety.

**TABLE 3410.6.17  
SPRINKLER SYSTEM VALUES**

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-3, F, M, R, S-1	-6	-3	0	2	4	6
A-2	-4	-2	0	1	2	4
A-4, B, E, S-2	-12	-6	0	3	6	12

**3410.6.17.1 Categories.** The categories for automatic sprinkler system protection are:

1. Category a — Sprinklers are required throughout; sprinkler protection is not provided or the sprinkler system design is not adequate for the hazard protected in accordance with Section 903.
2. Category b — Sprinklers are required in a portion of the building; sprinkler protection is not provided or the sprinkler system design is not adequate for the hazard protected in accordance with Section 903.
3. Category c — Sprinklers are not required; none are provided.
4. Category d — Sprinklers are required in a portion of the building; sprinklers are provided in such portion; the system is one which complied with the code at the time of installation and is maintained and supervised in accordance with Section 903.
5. Category e — Sprinklers are required throughout; sprinklers are provided throughout in accordance with Chapter 9.

6. Category f — Sprinklers are not required throughout; sprinklers are provided throughout in accordance with Chapter 9.

**3410.6.18 Incidental use.** Evaluate the protection of incidental use areas in accordance with Section 302.1.1. Do not include those where this code requires suppression throughout the building including covered mall buildings, high-rise buildings, public garages and unlimited area buildings. Assign the lowest score from Table 3410.6.18 for the building or fire area being evaluated. If there are no specific occupancy areas in the building or fire area being evaluated, the value shall be zero.

**TABLE 3410.6.18  
INCIDENTAL USE AREA VALUES<sup>a</sup>**

PROTECTION REQUIRED BY TABLE 302.1.1	PROTECTION PROVIDED						
	None	1 Hour	AFSS	AFSS with SP	1 Hour and AFSS	2 Hours	2 Hours and AFSS
2 Hours and AFSS	-4	-3	-2	-2	-1	-2	0
2 Hours, or 1 Hour and AFSS	-3	-2	-1	-1	0	0	0
1 Hour and AFSS	-3	-2	-1	-1	0	-1	0
1 Hour	-1	0	-1	0	0	0	0
1 Hour, or AFSS with SP	-1	0	-1	0	0	0	0
AFSS with SP	-1	-1	-1	0	0	-1	0
1 Hour or AFSS	-1	0	0	0	0	0	0

a. AFSS = Automatic fire suppression system; SP = Smoke partitions (See Section 302.1.1.1).

NOTE: For Table 3410.7, see the next page.

**3410.7 Building score.** After determining the appropriate data from Section 3410.6, enter those data in Table 3410.7 and total the building score.

**3410.8 Safety scores.** The values in Table 3410.8 are the required mandatory safety scores for the evaluation process listed in Section 3410.6.

**TABLE 3410.8  
MANDATORY SAFETY SCORES<sup>a</sup>**

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-1	16	27	27
A-2	19	30	30
A-3	18	29	29
A-4, E	23	34	34
B	24	34	34
F	20	30	30
M	19	36	36
R	17	34	34
S-1	15	25	25
S-2	23	33	33

a. MFS = Mandatory Fire Safety;  
MME = Mandatory Means of Egress;  
MGS = Mandatory General Safety.

**EXISTING STRUCTURES**

**TABLE 3410.7  
SUMMARY SHEET — BUILDING CODE**

Existing occupancy _____		Proposed occupancy _____	
Year building was constructed _____		Number of stories _____ Height in feet _____	
Type of construction _____		Area per floor _____	
Percentage of open perimeter _____%		Percentage of height reduction _____%	
Completely suppressed:    Yes _____ No _____		Corridor wall rating _____	
Compartmentation:        Yes _____ No _____		Required door closers:    Yes _____ No _____	
Fire-resistance rating of vertical opening enclosures _____			
Type of HVAC system _____, serving number of floors _____			
Automatic fire detection:    Yes _____ No _____,		type and location _____	
Fire alarm system:         Yes _____ No _____,		type _____	
Smoke control:             Yes _____ No _____,		type _____	
Adequate exit routes:      Yes _____ No _____		Dead ends: _____ Yes _____ No _____	
Maximum exit access travel distance _____		Elevator controls:        Yes _____ No _____	
Means of egress emergency lighting:    Yes _____ No _____		Mixed occupancies:      Yes _____ No _____	
<b>SAFETY PARAMETERS</b>		<b>FIRE SAFETY (FS)</b>	
3410.6.1 Building Height			
3410.6.2 Building Area			
3410.6.3 Compartmentation			
3410.6.4 Tenant and Dwelling Unit Separations			
3410.6.5 Corridor Walls			
3410.6.6 Vertical Openings			
3410.6.7 HVAC Systems			
3410.6.8 Automatic Fire Detection			
3410.6.9 Fire Alarm System			
3410.6.10 Smoke control		* * * *	
3410.6.11 Means of Egress		* * * *	
3410.6.12 Dead ends		* * * *	
3410.6.13 Maximum Exit Access Travel Distance		* * * *	
3410.6.14 Elevator Control			
3410.6.15 Means of Egress Emergency Lighting		* * * *	
3410.6.16 Mixed Occupancies			* * * *
3410.6.17 Automatic Sprinklers			÷ 2 =
3410.6.18 Incidental Use			
<b>Building score — total value</b>			

\* \* \* \*No applicable value to be inserted.

**3410.9 Evaluation of building safety.** The mandatory safety score in Table 3410.8 shall be subtracted from the building score in Table 3410.7 for each category. Where the final score for any category equals zero or more, the building is in compliance with the requirements of this section for that category. Where the final score for any category is less than zero, the building is not in compliance with the requirements of this section.

**3410.9.1 Mixed occupancies.** For mixed occupancies, the following provisions shall apply:

1. Where the separation between mixed occupancies does not qualify for any category indicated in Section 3410.6.16, the mandatory safety scores for the occupancy with the lowest general safety score in Table 3410.8 shall be utilized (see Section 3410.6.)
2. Where the separation between mixed occupancies qualifies for any category indicated in Section 3410.6.16, the mandatory safety scores for each occupancy shall be placed against the evaluation scores for the appropriate occupancy.

**TABLE 3410.9  
EVALUATION FORMULAS<sup>a</sup>**

FORMULA	T.3409.7		T.3409.8	SCORE	PASS	FAIL
FS-MFS ≥ 0	_____ (FS)	-	_____ (MFS) =	_____	_____	_____
ME-MME ≥ 0	_____ (ME)	-	_____ (MME) =	_____	_____	_____
GS-MGS ≥ 0	_____ (GS)	-	_____ (MGS) =	_____	_____	_____

- a. FS = Fire Safety  
 ME = Means of Egress  
 GS = General Safety

- MFS = Mandatory Fire Safety  
 MME = Mandatory Means of Egress  
 MGS = Mandatory General Safety

